

An Empirical Investigation of the Determinants of Earnings Management in Pakistani Manufacturing Firms

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Abstract

Purpose – The purpose of this paper is to underline the determining factors motivating firms to indulge in earning management practices, compromising financial reporting quality.

Design/methodology/approach – Data from 168 manufacturing firms from the Pakistan stock exchange were extracted during 2010-2021. To create dependent variable GMM approach is utilized, whereas the panel data approach of fixed/random is used to estimate the reported results.

Findings – Findings of this study imply that a firm's size and profitability are significant determinants of earnings management proxies i.e., accruals as well as real earnings management. Whereas market growth is negatively significant with abnormal accruals and abnormal cash flow from operations. Leverage is found to be negatively significant with abnormal accruals and abnormal cash flow from operations. Dividend per share is negatively significant with abnormal discretionary expense and abnormal production cost. And tax payments negatively impact the accruals while insignificant with the rest of the three proxies.

Practical implications –The findings of this study will draw policymakers' attention to implementing stringent regulations and oversight mechanisms that promote transparency and accuracy in financial reporting, such as increased disclosure requirements, enhanced auditor independence, and more robust enforcement mechanisms. Policymakers should also promote greater financial literacy among investors and the public to enhance their ability to assess the quality of financial reporting and identify potential instances of earnings management.

Originality/ value – Studying the determinants of earnings management in Pakistan provides insights into the unique factors that may drive earnings management practices in a developing country context. It can help to inform policy and investment decisions in this specific setting. And contribute to the wider literature on earnings management and financial reporting quality.

Keywords: Abnormal Accruals, Real, Discretionary Expense, Production Cost, Earnings Management

Introduction

“One function of financial reporting is to constrain management to act in the shareholders' interest.” Watts and Zimmerman (1978, p. 113).

The traditional view on the value of accounting information is the dual role of information: informativeness and stewardship (Ronen, 1979; Dye, 1988; Antle & Demski, 1989). The informativeness role arises from investors' demand for information to predict future cash flows and assesses their risk (Francis, Schipper, and Vincent (2003). The stewardship role of accounting comes from the separation between ownership and management in public firms, which puts the manager in the position of steward to shareholders. According to Jensen (1978), managers act as self-interested individuals, and goal congruence between the shareholders and managers is no longer assured. For shareholders, the remedy is to demand information to monitor the manager after he has acted and to provide him with incentives that align his interests with their own before he acts. Thus earnings become the primary objective to manipulate in financial reports (Ronen & Yarri, 2008, p.6).

Warfield, Wild, and Wild (1995) proposed two potential reasons for earnings management: either managers do it to circumvent accounting-based contracts meant to address agency issues, or they do it to reduce information asymmetry. Different monitoring mechanisms inclined managers to act in the best interest of shareholders. For instance, Githaiga, Kabete, & Bonareri (2022) investigate the relationship between board characteristics and earnings management by taking a sample from developing nations, i.e., the East African Community, during 2011 and 2020. Findings reveal that board independence, board gender diversity, and board financial expertise had a negative and significant effect on EM. More recent evidence from Pakistan confirms that boards with female directors are more effective in restricting both accrual-based and real earnings management, particularly when at least two female directors serve on the board (Rahman et al., 2025). Naz et al. (2022) study the impact of ownership structure on earnings management by taking a sample from Pakistan from 2010 to 2019. Findings indicate that managerial and blockholder ownership act as a monitoring mechanism and restrain managers from using their discretion. Extending this line of inquiry, recent research shows that firms with greater ownership concentration and managerial ownership significantly reduce real earnings management (Shuto, 2024). Ajay and Madhumathi (2022) examine whether executive compensation influences the earnings management activities in Indian manufacturing firms. A higher compensation ratio reduces discretionary accruals and real earnings management, which contradicts the findings of Shuto (2007) and Adut et al. (2013). This shows that managerial compensation improves the earnings quality of firms. However, recent findings from Pakistan suggest that CEO compensation does not necessarily induce earnings management, and this result remains consistent across family versus non-family firms and at different levels of ownership concentration.

It is essential to note that little is known about the determinants that motivate managers to indulge in earnings management practices, especially in developing countries. A systematic review of emerging economies identifies concentrated ownership structures, weak regulatory mechanisms for investor protection, low levels of enforcement, and cultural factors as key country-level determinants influencing EM practices (Gokhale & Pillai, 2024). In Pakistan, a few empirical studies have analyzed the role of corporate governance mechanisms on earnings management, such as Al-Duais et al. (2022), who aim to investigate the monitoring role of ownership structure (OWS) on real earnings management (REM) practices. The examination of the data indicates that there is a positive correlation between the quality of financial reporting and family, foreign, and institutional ownership. More recently, Shah et al. (2024) empirically investigated how companies listed on the Pakistan Stock Exchange manage their earnings from 2010 to 2019 and examined the impact of corporate governance on the choice of earnings management strategies, finding that governance practices influence whether earnings management is opportunistic or efficient. Biswas et al. (2022) examine the role of corporate governance (CG) on earnings management (EM) in Indian commercial banks from 2010 to 2019. Through principal component analysis, eight measures of CG (women director, independent women director, frequency of audit committee,

audit committee, board size, board independence, and frequency of board meetings) were introduced as an index. Findings indicate a negative association between CG and EM. In the Pakistani context, Khan et al. (2024) found that EM is less prevalent in affiliated firms compared to non-affiliated companies, though effective governance could not reduce EM in affiliated companies of family business groups, supporting the principal–principal agency theory perspective. Some others study the role of capital structure on accruals as well as real earnings management; for instance, Naz & Sheikh (2023), Lassoued (2022), and Kalbuana, Suryati, & Pertiwi (2022) study the debt structure and earnings management and find a negative relationship. Naz and Sheikh (2023) specifically found that all three measures of capital structure—total debt ratio, long-term debt ratio, and short-term debt ratio—are inversely related to accrual-based earnings management in Pakistani non-financial firms. Whereas Izobo, Ewiwile, & Orowhuo (2022) report a positive relation. Likewise, other studies analyzed the role of remuneration packages on earnings management; for example, Alkebsee et al. (2022) examine how the cash compensation paid to audit committees impacts the management of accrual earnings. Through an analysis of data from Chinese listed companies between 2007 and 2017, the results reveal a positive correlation. This implies that providing high levels of cash compensation to audit committee directors may undermine their ability to effectively monitor financial reporting quality and may cause them to align their interests more closely with those of the company's managers. Alkebsee et al. (2022) investigate the association between chief executive officers' and chief financial officers' cash compensation and REM and finds that CEOs' and CFOs' cash compensation is significantly associated with REM, suggesting that paying non-equity compensation to the CEO and CFO is negatively associated with REM. More recent evidence from Pakistan indicates that audit committee effectiveness—particularly size, independence, and meeting frequency—plays a significant role in curtailing earnings management activities in the banking sector (Kant & Shah, 2025). Furthermore, corporate sustainability practices have been found to significantly control accruals-based earnings management in Pakistani companies, with firm size further amplifying these relationships (Rahman et al., 2024).

These inconclusive findings of prior studies drove this research to re-investigate the factors affecting management to manipulate the reported earnings in Pakistan. The uniqueness of studying the determinants of earnings management in Pakistan lies in the country's specific institutional and cultural context, which may differ from other countries where similar research has been conducted. Pakistan is a developing country with unique cultural, political, and economic characteristics, which may influence the financial reporting practices of firms operating within the country. For example, Pakistan has a weak legal and regulatory framework, and limited enforcement mechanisms, which may create incentives for managers to engage in earnings management practices to meet market expectations or to avoid penalties or scrutiny from regulators. Recent research confirms that politically connected businesses in Pakistan show a high level of involvement in income-decreasing real earnings management, though monitoring mechanisms such as audit quality and family control curb this opportunistic behavior (Baig et al., 2023). Moreover, Pakistan's manufacturing sector is an essential part of the country's economy, accounting for a significant portion of its GDP and employment opportunities. Therefore, understanding the determinants of earnings management in Pakistani manufacturing firms is crucial for policymakers and investors, as it can help identify potential risks and opportunities associated with investing in these firms. A recent study on Pakistan's manufacturing sector examined how board characteristics impact firm performance and whether earnings manipulation moderates this relationship (Arif et al., 2025). Based on the discussion, this research is in the queue to answer the following research question.

RQ: What are the determinants of accruals and real earnings management among Pakistani manufacturing firms?

By answering the question, this study will advance the knowledge of the drivers of earnings management practices in developing countries. Further, it will help policymakers, regulators, and investors to formulate policies of disclosure requirements and better financial reporting quality. The rest of the paper will be organized as follows: Section 2 will provide a review of the relevant literature. Section 3 will outline the data and methodology used in this study. Section 4 will present the findings of the research. Section 5 will offer a detailed discussion of the results. Finally, Section 6 will offer concluding remarks and suggestions for future research.

Literature Review

The political costs hypothesis states that large firms choose accounting methods that allow postponing earning disclosure to future periods. Indeed, the larger the firm, the greater the probability of being subjected to the pressure of the most influential. This encourages managers to choose accounting methods that reduce earnings in order to reduce political costs determined based on accounting figures (Cormier et al., 1998). Positive accounting theory explains observed accounting and auditing practices to explain the empirical relation between firm size and earning management practices. According to Watts and Zimmerman (1986), large firms attract more attention than small firms do, causing the former to distribute their wealth through mechanisms such as taxes and insurance. This situation affects firms' performance, particularly managers' wealth since they are exposed to taxes or additional costs that arise from regulations and related information costs. According to Watts and Zimmerman (1986) accounting theory aims to explain and predict the practice of accounting by describing why an accounting practice is conducted, which more specifically reveals the influence of economic variables on managerial motivation in choosing an accounting method. The notion of earnings management arises because managers expect a benefit from the actions taken in reverse manufacturing. There are three main hypotheses that form the basis for developing hypothesis testing to detect earnings management as follows: (1) Bonus plan hypothesis, managers in companies with bonus plans tend to choose accounting procedures that can move earnings reports into future periods or known as income smoothing, (2) Debt covenant hypothesis, corporate managers with large leverage ratios tend to choose accounting procedures with reported earnings changes from future periods to current periods, as it will give the company a small leverage ratio, and (3) Political cost hypothesis, the greater the cost of corporate politics, managers tend to choose accounting procedures that postpone the earnings report from the current period to the future period.

In such circumstances, managers are likely to select the accounting standards that report a lower income to reduce size-related costs, since they are motivated to select on behalf of the companies and their own interests (Tehrani et al. 2011). Watts and Zimmerman (1978) reveal that large companies select accounting methods that allow postponing the earnings disclosure to future periods. Jones (1991) provides evidence that during times of investigation, managers are more likely to decrease earnings by accruals manipulation. Türegün, (2018) study the relationship in turkey and report that large firms and those with large boards use EM more than those with small boards do. Whereas Farooqi et al. (2014) find that large firms engage in fewer earnings management than small firms. Charfeddine, Riahi, and Omri (2013) find that managers select the practices that reduce earnings to lower the amount of tax payable in Tunisia. Moses (1997) states that companies are more likely to have a greater incentive for income smoothing compared with small companies, as it has a greater political cost. Political costs occur high due to the profitability of the company which can attract the attention of the media and consumers.

Harris, Karl, and Lawrence, (2019) report that firm size negatively impacts the earnings management tactics by managers. Nuryaman (2008) and Veronica and Siddharta (2005); Halim, et al. (2005) also found evidence that firm size negatively affects earnings management in the

United States. This means that large companies have fewer opportunities to perform earnings management and vice versa. Companies with medium and large size have more strong pressure from the stakeholders. This prompted the management to meet investors' expectations so the tendency of management does greater earnings management. Whereas, Harahap, (2019) found that firm size do not affect Earnings Management. Based on these inconclusive findings we hypothesized that

H: Firm size is a significant determinant to curb earnings management practices.

Profitability

The profitability of a company reflects the effectiveness of its management in generating profits. A higher Return on Assets (ROA) ratio indicates a more efficient use of assets, leading to increased profitability. The ROA ratio reflects how effectively the company's assets are being used to generate net profits. (Harahap, 2019). According to research, managers may engage in earnings manipulation to impact their firms' equity valuation, although doing so incurs a cost that rises and becomes more severe as the level of manipulated earnings increases. Companies that have strong performance and growth tend to overstate their earnings by a greater margin, as the responsiveness of stock prices to earnings improves with stronger performance and growth (Nagar, 2006; Dechow et al., 2011; Zang, 2012). Research studies have demonstrated that engaging in earnings management activities has a substantially adverse effect on the future value, earnings growth, and future cash flow of a company. This negative impact can be attributed to opportunistic earnings management (Healy & Palepu, 1993). Akram et al., (2015) study the relationship between earnings management and firm performance in construction and materials in Pakistan and India. Findings reveal that earnings management impact firm performance negatively in the Pakistani scenario. Whereas this relationship is insignificant in Indian scenario. Another perspective suggests that managers engage in earnings management practices to boost reported earnings, which ultimately benefits shareholders (Arya et al., 2003; Bowen et al., 2008; Guay et al., 1996). For instance, Kalbuana, Suryati and Pertiwi, (2022) report that profitability has a significant positive effect on earnings management. This research contradicts from Agustia & Suryani (2018), Fandriani & Tunjung (2019) and Astuti (2017) findings, which state that profitability had no significant impact on earnings management. Hence, this study hypothesizes that

H: Profitability has a positive/negative relationship with accruals and real earnings management.

Growth opportunities

Madhogarhia et al., (2009) provide empirical evidence that growth firms have more incentive to 'manage their earnings' and that they do so more aggressively as compared to value firms. The primary reason for this behavior is that stock prices of growth firms suffer disproportionately large negative adjustments when these firms report earnings disappointments. Information asymmetries are more severe for growth firms. Using a sample of cross-listed and U.S. firms, Jategaonkar et al., (2022) provide evidence that firms' growth opportunities are associated with discretionary accruals and/or real activities management. Using Tobin's Q as a growth opportunity, their study reports a higher tendency to manage discretionary accruals and real activities for cross-listed growth firms than the cross-listed value firms. In addition, the difference in earnings management between cross-listed and U.S. firms is concentrated in the growth firms, as there are no significant differences in earnings management between the cross-listed and U.S. value firms. Chen & Liu (2010) study the relationship in Taiwan and find that high-growth firms with independent corporate boards in the post-regulatory changes of the Corporate Governance era are associated with less earnings management. Therefore, the following hypothesis is as follows.

H: There is a significant association between growth opportunities and earnings management practices of the firm.

Leverage

Literature submits that debt proportion impacts the opportunistic behaviors of a firm, theoretically explained by Debt/equity hypothesis (Watts and Zimmerman, 1990). As AEM and REM result in poor accrual quality and higher information risk to the lenders (Francis et al., 2005). To reduce the risk, lenders will resort to incorporating restrictive covenants (Begley, 1990). Debt imposes covenant restrictions and penalties if any violation or some technical default is detected. Using an improved measure of debt covenant, Pittman and Zhao (2020) found that financial statement misstatement is strongly associated with debt covenant restrictions. They noted that managers use both income-increasing and non-income-increasing tactics to prevent covenant violations. Managers utilize their judgment to alleviate debt restrictions and potential costs of a technical default by selecting accounting methods that increase income. As a result, there is a positive correlation between the ratio of long-term debt and earnings management (EM).

For instance, Okyere et al., (2021) utilized data from non-financial firms from selected sub-Saharan African countries over the period 2008 to 2018 and concludes that earnings management is associated with low equity usage and by implication, high leverage levels among firms. Naupal, 2019, studies the relationship in the Indonesian market and affirms that leverage and firm size have a positive impact on earnings management. Avabruth & Padhi, (2022) study the relationship in the Indian economy, their findings reveal that family firms in India aim to pass the business to the next generation hence they engage in earnings management practice. Stockmans et al. (2010) observed higher levels of earnings management among poorly performing family firms.

The opposing viewpoint is debt act as a control mechanism for potential conflicts of interest, explained by Jensen's (1986) control hypothesis. Jensen and Meckling (1976) and Jensen (1986) maintain that financing policy attracts increased monitoring and scrutiny on outside creditors, limiting managerial opportunism and under-investments. Thanh et al. (2020) document the same, from Vietnamese firms that the capital structure of a firm has a non-linear effect on earnings management. As the debt structure changes from 33 percent to 57 percent, it makes firm managers more willing to be involved in earnings management. Muñoz Mendoza et al., (2020) study the relationship in Latin America and conclude that leverage and short-term debt have a negative and nonlinear effect on EM practices. Nonlinearity suggests that firms with high levels of leverage and short-term debt carry out positive discretionary accruals. Hanafi, Rohman, & Ratmono, (2022) study the leverage and block holder impact in the Indonesian market and report a negative relation with AEM. As debtholders do not want earnings manipulation because, through debt covenants, they are safe with certainty in paying debts and interest. Hence, we posit the hypothesis as;

H1: Long term debt ratio is a significant determinant of AEM and REM.

Dividend

The seminal work of Lintner (1956) and Baker & Powell (2000) advocates that managers have a strong desire to maintain their historic dividend policy and target both dividend level and long-term payout ratios. The significance is evident by empirical research that shows a large negative stock market reaction to unexpected dividend decreases or omission and the stock market's perception of the value relevance of dividends (Healy & Palepu 1988; Ozo & Arun, 2019; Zahan & Rana, 2020). Hence managers prefer a stable dividend policy. This justification is in line with the signaling theory (Hussain & Akbar, 2022). To maintain a long-term payout policy, managers voluntarily maintain constant earnings (Lintner, 1956) for which they have to manage. He et al. (2017) study a sample of 29 countries and conclude that managers of dividend-paying firms have less incentive to manage their earnings than non-paying firms, and this relationship is much stronger in countries where high opacity and weaker investor protection exist. Using the panel data approach, Nguyen and Bui (2019) and Tran (2020) demonstrated that dividend-paying firms restrict managers' manipulation of earnings and vice versa. Conversely, in the agency theory

presented by Jensen (1986), the availability of excess cash flows to managers is a vital source of the agency problem. If cash flows exceed the required cash to finance positive net present value (NPV) projects, managers would be motivated to use their discretion on earnings (Trinh et al., 2022). In the absence of explicit restrictive clauses, the implicit agreement between shareholders and a firm about payments of dividends leads to more manipulation of earnings (Mard, 2004). Eskandar and Bolori (2021) concluded that dividend payments encourage managers to manage earnings in Iran. They also found that firm ownership type significantly moderates the relationship between dividends and EM practices. Handoyo & Kusumaningrum (2022) documented that dividend payments suppress managers' involvement in EM practices in the Indonesian banking industry. Moreover, using data from 2008 to 2015, Salah and Jarboui (2022) documented that the response of dividend payments to reporting quality is positive when estimating the coefficients of French-listed firms.

Furthermore, the findings of Haider, Ali & Saiq (2012), Aurangzeb & Dilawe, (2012) report no relationship between the dividend policy and REM. There has been a wide range of studies in the past decades, but no consensus exists on the role of dividend payments on EM (Barros, Matos, & Sarmento, 2022). Based on this we hypothesized that;

H: Dividend per share is a significant determinant of AEM as well as REM.

Taxes

Financial analysts scrutinize tax expense as a source of earnings management to increase firms' value (Dhaliwal et al., 2003). The tax expense is one of the last accounts closed before earnings are announced, thus it provides a final opportunity for earnings management. The tax expense reported in the income statement consists of two components, current-year tax expense (tax credit) and deferred tax expense (deferred tax credit). Temporary differences arise between the periods in which transactions affect accounting income and the periods in which they affect taxable income. As Earnings management is accomplished through managerial discretion over accounting choices and operating cash flow (Healy & Wahlen, 1999).

The underlying assumption in preparing financial statements is that managers exercise discretion to manage the book income upward without increasing the taxable income (Mills & Newberry, 2001). These activities will generate book-tax income differences. Higher deferred tax expense means the magnitude of differences between book-tax incomes, which indicates the increasing probability of managing earnings to avoid reporting earnings decline and loss.

Firms manage earnings in order to minimize the present value of their tax expenses. Several studies (Gramlich, 1991; Boynton, Dobbins, & Plesko, 1992; Dhaliwal & Wang, 1992; Manzon, 1992) have found that firms used discretionary accruals to reduce income.

Maydew (1997), estimates that by pushing gross margin forward and selling and administrative expenses backward, firms with net operating loss carrybacks shifted income to quarters with lower tax rates, which yielded aggregate savings. Similarly, Scholes, Wilson, & Wolfson (1992), and Guenther (1994), document the shifting of income from years with high rates to years with lower tax rates.

Dhaliwal, Frankel, & Trezevant (1994), and Hunt, Moyer, & Shevlin (1996), show that firms manage inventories to reduce taxable income without compromising reported earnings in the financial reports. They find that LIFO firms manage tax expenses by accelerated purchases to inventory when the tax rate is high and delayed purchases when the rate is low. It is noteworthy that income-increasing earnings management increases tax expenses. This leads Eilifsen, Knivsfla, & Sættem (1999), to theorize that, at least in the short run, taxation has a favorable effect on the occurrence of pernicious earnings management because it renders the behavior costly. Klassen (1997), provides support for this theory by showing that firms with a lower level of pressure from the capital market indeed manage their tax outlays by engaging in the divestiture of assets with

lower gains and higher losses. At the same time, some firms are willing to manage earnings and pay taxes on non-existent income. The fact that taxable income does not coincide with financial-reporting income does not alter the reality that taxation increases the cost of managing earnings to inflate income. Hence, we theorize that;

H1. Taxes are a significant determinant of EM.

Data and Methodology

The data is collected from the annual reports of manufacturing firms listed on the Pakistan Stock Exchange (PSX, hereafter) spanning over the period 2010-2021. Since the dependent variables take the lag difference in their estimation, two years of data have been lost from the sample. The sample is drawn out from 480 firms listed on PSX on May 2021. Given that the REM models apply only to manufacturing firms, hence financial sector comprising 94 financial firms was excluded from the sample. Out of the total 386 listed firms, firms with missing data, non-availability of data, or aborted operations during the selected period were also excluded from the sample, leaving behind 168 firms. EM models require 20 minimum observations from a given industry hence industries unable to fulfill this criterion were also excluded from the sample. Therefore, the balance panel comprises 168 firms with 1680 observations.

Variable Description

In this section variables used in this study are presented.

Dependent Variable

In the literature, two distinct measures of earnings management are reported. Following Naz and Sheikh, (2023) and Avabruth & Padhi (2022), this study utilizes both of them i.e., abnormal accruals as well as real earnings management.

Accruals Earnings Management

The discretionary accruals which are defined as *the extent to which accruals embedded in earnings are opportunistically used by management* (Jones 1991). Residuals from the performance matched modified version of the Jones (1991) model presented by Kothari et al (2005) is used to estimate the discretionary accruals, which is presented in EQ. 1.

$$\frac{TA_{i,t}}{A_{i,t-1}} = \beta_0 + \beta_1 (1/A_{i,t-1}) + \beta_2 (\Delta REV_{i,t} - \Delta REC_{i,t} / A_{i,t-1}) + \beta_3 (PPE_{i,t} / A_{i,t-1}) + \beta_4 (ROA_{i,t}) + \varepsilon_{t,i} \quad \text{.....EQ. 1}$$

Here, non-discretionary part (which are total accruals from normal business operations) is calculated as the income before extraordinary items (*EBEI*) minus cash flows from operations (*CFO*) scaled by the lag of total assets. Whereas, the discretionary accruals (where managers may use their discretion to alter the timing, category, etc) are estimated through, ΔREV ; change in revenue, ΔREC ; change in receivables, PPE ; plant, property, and equipment, and ROA is profit after tax to total assets. while discretionary accruals involve managerial discretion in reporting. The residuals obtained from this difference are Abnormal accruals.

Abnormal accruals = (Non-Discretionary accruals – Discretionary accruals)

Residuals are calculated for each industry and each year with at least 20 observations.

Real Earnings Management

Consistent with Naz and Sheikh, (2023) and Avabruth & Padhi, (2022) this study uses three measures of REM as estimated by RoyChoudhury (2006) i.e., abnormal cash flow from operations explains the deviation from normal cash flows, abnormal discretionary expense explains how managers cut discretionary expense to adjust earnings, and abnormal production

cost which is the managerial manipulation in production cost. All three models are elaborated in EQ. 2,3,4 respectively.

$$\text{CFO}_{i,t} / A_{i,t-1} = \beta_0 + \beta_1 (1 / A_{i,t-1}) + \beta_2 (S_t / A_{i,t-1}) + \beta_3 (\Delta S_t / A_{i,t-1}) + \varepsilon_{i,t}^{\text{CFO}} \quad \text{EQ. 2}$$

$$\text{DisExp}_{i,t} / A_{i,t-1} = \beta_0 + \beta_1 (1 / A_{i,t-1}) + \beta_2 (S_t / A_{i,t-1}) + \varepsilon_{i,t}^{\text{DisExp}} \quad \text{EQ. 3}$$

$$\text{PROD}_{i,t} / A_{i,t-1} = \beta_0 + \beta_1 (1 / A_{i,t-1}) + \beta_2 (S_t / A_{i,t-1}) + \beta_3 (\Delta S_t / A_{i,t-1}) + \beta_3 (\Delta S_{t-1} / A_{i,t-1}) + \varepsilon_{i,t}^{\text{PROD}} \quad \text{EQ. 4}$$

CFO is cash flow from the operation, S_t is the sales of the year, ΔS_t is the change in sales, DisExp is the discretionary expense (selling, general, administrative, and R& D), Prod is the sum of change of inventory and cost of goods sold, ΔS_{t-1} is the last year sales minus last year sales. Deviations from business operations from normal levels, result in abnormal proxies. The residuals obtained from the difference in normal and abnormal operations are used for further analysis.

Independent Variables

Consistent with earlier studies, the definitions of determinants used are listed in table 2.

Table 2: Variable definitions

Variable	Symbol	Definition
Firm size	SIZ	Natural log of sales
Profitability	PRO	Ratio of profit before tax to total assets
Growth opportunities	MBR	Market price per share to book value per share
Leverage	LEV	Ratio of non-current liabilities to total asset
Dividend per share	Div	Ratio of total dividend to outstanding stock
Tax	Tax	Ratio of profit before tax minus profit after tax divided by profit before tax

Methodology

To investigate the determinants of EM, panel data analysis is used in this study as the data was collected cross-sectionally across firms over study years.

The regression equation are as follows.

$$\text{AEM}_{i,t} = \beta_0 + \beta_1 (\text{SZE}_{i,t}) + \beta_2 (\text{PRO}_{i,t}) + \beta_3 (\text{MBR}_{i,t}) + \beta_4 (\text{LEV}_{i,t}) + \beta_5 (\text{DIV}_{i,t}) + \beta_6 (\text{TAX}_{i,t}) + \varepsilon_{i,t}^{\text{AEM}} \quad \text{EQ. 5}$$

$$\text{ACFO}_{i,t} = \beta_0 + \beta_1 (\text{SZE}_{i,t}) + \beta_2 (\text{PRO}_{i,t}) + \beta_3 (\text{MBR}_{i,t}) + \beta_4 (\text{LEV}_{i,t}) + \beta_5 (\text{DIV}_{i,t}) + \beta_6 (\text{TAX}_{i,t}) + \varepsilon_{i,t}^{\text{ACFO}} \quad \text{EQ. 6}$$

$$\text{ADixp}_{i,t} = \beta_0 + \beta_1 (\text{SZE}_{i,t}) + \beta_2 (\text{PRO}_{i,t}) + \beta_3 (\text{MBR}_{i,t}) + \beta_4 (\text{LEV}_{i,t}) + \beta_5 (\text{DIV}_{i,t}) + \beta_6 (\text{TAX}_{i,t}) + \varepsilon_{i,t}^{\text{ADixp}} \quad \text{EQ. 7}$$

$$\text{AProd}_{i,t} = \beta_0 + \beta_1 (\text{SZE}_{i,t}) + \beta_2 (\text{PRO}_{i,t}) + \beta_3 (\text{MBR}_{i,t}) + \beta_4 (\text{LEV}_{i,t}) + \beta_5 (\text{DIV}_{i,t}) + \beta_6 (\text{TAX}_{i,t}) + \varepsilon_{i,t}^{\text{AProd}} \quad \text{EQ. 8}$$

Fixed and random effects have been used for the above models after dealing with the heterogeneity and endogeneity issues. Hausman's (1978) test has been used to choose between fixed and random. For heteroskedasticity, Breusch pagan test was performed. For serial correlation, Wooldridge's (2010) test for panel data was performed.

Residuals of AEM and REM were estimated through Blundell–Bond and Arellano–Bond tests. As Greene (2000) advocates that estimation models comprising multiple lags, especially in their dependent variable, may lead to autocorrelation between lagged endogenous variables and residuals when estimated through simple regression. Hence, the results obtained might be biased and inconsistent. GMM uses an instrumental variable to resolve endogeneity, measurement errors,

and heterogeneity issues. Following, Naz and Sheikh, (2023) this study uses the lagged difference of the dependent variable as an instrumental variable for respective models. Residuals obtained from GMM were used as discretionary accruals, abnormal production, abnormal cash flow from operations, and abnormal discretionary expense in further analysis. All these models are predicted for each industry and year.

Following Naz and Sheikh, (2023) and Shah *et al.* (2020) abnormal cash flows from operations and abnormal discretionary expenses are multiplied by -1 to interpret the same as abnormal production cost and discretionary accruals. Consequently, a higher value points to a higher possibility of altering operational judgments to boost revenue.

The results from two specification tests i.e., no second-order serial correlation in the disturbance term and instruments validity are consistent with the GMM estimators. The Arellano-Bond test statistics for no first-order serial correlation are significant while the test statistics for no second-order serial correlation are insignificant, Thus the requirement of no AR2 is satisfied. Both Hansen *J*-statistics and Sargan test for instruments over-identification restriction are also statistically insignificant, suggesting the validity of the instruments used to estimate the GMM. The coefficients of the lag of dependent variables are positive and significant in all respective models. Thus, all the requirements of the GMM estimators are met.

Results and Discussion

The descriptive stats of the variables are provided in table 3. In the study sample, firm size with a minimum value of 12 and a maximum value of 26 indicates that small and large firms are part of the sample. As the results will provide a holistic view of managerial practices on earnings management. The mean value of return on assets indicates that on average manufacturing firms are earning 4 percent profit. The average market growth is 1.331 times. The mean value of 0.167 of the long term debt ratio indicates that firms are relying 16 percent on long-term debt in their capital structure. An average mean value of dividend per share of 9.48 indicates that companies are paying dividends against the common stock. The mean value of Aac (0.002) indicates that managers of Pakistani firms are slightly managing accruals to total assets. Whereas managing cash flow from operations by 5 percent to total asset and discretionary expenses by 6 percent. The rationale for these findings is consistent with the argument that accruals are easy to detect by auditors while any manipulation in real earnings management is difficult to detect by a third party.

Table 3 : Descriptive statistics

Variables	Observations	Mean	Std. dev.	Min.	Max.
SZE	1680	21.810	2.126	12.286	26.057
PRO	1680	0.042	0.180	-2.642	1.372
MBR	1680	1.331	10.613	-113.23	106.45
LEV	1680	0.167	0.183	0.00	2.263
DIV	1680	9.484	42.793	0.00	715.70
Tax	1680	0.275	1.791	-10.775	43.525
Aac	1680	0.028	0.022	-0.049	0.0564
Acfo	1680	-0.054	0.033	-0.031	-0.134
Adixp	1680	-0.064	0.035	-0.003	-0.176
Aprod	1680	0.890	0.484	0.1045	1.666

Legends: SZE; Firm size, PRO; Profit before tax to total assets, MBR; Market to book ratio, LEV; Long-term debt ratio, DIV; Dividend per share.

Table 4 represents the pairwise correlation matrix of independent variables. The regression analysis depicts that firm size is positively correlated with PRO, MBR, DIV, and taxes, whereas negatively with leverage. PRO is positively correlated with market growth opportunities, dividend per share, and taxes and negatively with long-term debt ratio. MBR is positively related to

dividends per share and taxes while negative with LEV. Dividends is negatively related to taxes. The correlation coefficient for all the variables is less than 8. therefore, the existence of multicollinearity among the independent variables can be safely ruled out (Dormann et al., 2013). This is also evident by the Variance inflation factor, which is less than three for all variables indicating the absence of multicollinearity among explanatory variables (Johnston, 1984).

Table 4: Correlation matrix

	SZE	PRO	MBR	LEV	Div	TAX	VIF
SZE	1.00						1.27
PBO	0.447	1.00					1.39
MBR	0.189	0.340	1.00.				1.20
LEV	-0.044	-0.143	-0.018	1.00			1.03
Div	0.188	0.168	0.270	-0.081	1.00		1.11
TAX	0.026	0.021	0.027	-0.024	-0.003	1.00	1.00

Legends: SZE; Firm size, PRO; Profit before tax to total assets, MBR; Market to book ratio, LEV; Long term debt ratio, Div; Dividend per share, Tax; Taxes of the year.

Regression results are presented in table 5 of the impact of the determinants on EM. as shown in the table, firm size and profitability are statistically significant in all four models. Whereas market growth is negatively significant with Aac and ACFO. Leverage is negatively significant with Aac and ACFO. Dividend per share is negatively significant with ADixp and AProd. And tax payments negatively impact the accruals while insignificant with the rest of the three proxies. All the regression models were analyzed with year and industry effects. R square for the Aac, ACFO,ADixp and AProd model are 44,67, 10, and 28 respectively. Hausman test suggests the random effect is better than the fixed effect for Acc, whereas the fixed effect is better for ACFO, ADixp, and AProd.

Table 5: Determinants of EM

Variables	AEM		REM	
	Aac (1)	ACFO (2)	ADixp (3)	AProd (4)
	0.00*	0.00*	0.015*	0.000*
SZE	7.58	10.98	2.46	4.17
	0.00*	0.00*	0.041*	0.038
PRO	6.21	5.87	2.06	2.09
	0.005*	0.032*	0.160	0.264
MBR	-2.84	-2.14	1.41	1.12
	0.031*	0.059*	0.741	0.485
LEV	-1.51	-0.58	-0.33	-0.70
	0.430	0.350	0.00*	0.00*
Div	-0.79	-0.93	-4.87	-4.34
	0.00*	0.875	0.852	0.989
Tax	-3.61	0.16	0.191	0.02
Year effect	Yes	Yes	Yes	Yes
Industry effects	Yes	Yes	Yes	Yes
R ²	44.01	67.37	10.46	28.65
Prob > F value	367.22	21.67	12.61	11.75
F-stat	0.00	0.00	0.00	0.001
Hausman test	0.9929	0.00	0.00	0.017
Breusch pagan test for heteroscedasticity				
N	1680	1680	1680	1680

Legends: SZE; Firm size, PRO; Profit before tax to total assets, MBR; Market to book ratio, LEV; Long term debt ratio, Div; Dividend per share, Tax; Taxes of the year.

Discussion

This study investigates the determinants of AEM as well as REM. Regression results showed that firm size has a positive relationship on AEM as well as REM proxies indicating that EM practices are irrelevant to firm size. One possible reason might be that larger firms may have more complex operations, which could make it easier to use accounting techniques to hide or manipulate financial results as compared to small firms which are more vulnerable to financial shocks and market pressures. Additionally, larger firms may face more pressure to meet or exceed financial targets, such as earnings per share (EPS) or return on assets (ROA), in order to maintain their stock price or secure financing.

Consistent with Lobo and Zhou (2006); Kim et al., (2003); Shah et al., (2020) results indicate that larger firms may be more inclined to manage their earnings because the complexity of their operations makes it difficult for top management, institutional investors, analysts, and rating agencies to detect overstatement, and to avoid reporting earnings decreases consequently, managers apply more aggressive accounting policies as well as shifting real economic operations. Whereas small firms due to their size have higher visibility to detect any manipulation and are financial constraints; hence to avoid reporting losses are more inclined towards EM. The results are consistent with those Saona, et al., (2018), Degeorge et al., (1999), and Fernandes, (2007).

Profitability has a positive effect on AEM and all three proxies of REM. Profitable companies may have more resources and incentives to engage in these practices. For instance, a company with high profitability may feel more pressure to maintain or exceed its earnings targets, and may therefore use accruals or real earnings management techniques to manipulate its financial results. An annual report is an source of information that a company can make public, which can serve as an signal to external parties. Investors and potential investors use this information as a key factor in their decision-making process. Companies that can provide good signals and deliver good information are more likely to attract investment. In the line with signaling theory put forward by Jogyianto (2014), information published as an announcement will provide a signal for investors in making investment decisions. When information is announced, market participants first interpret and analyze the information as a good signal or a bad signal. If the announcement of this information is considered a good signal, investors will be interested in trading shares, thus the market will react, which is reflected in changes in stock trading volume (Suwardjono, 2010). Therefore, company managers will be motivated to carry out earnings management to convey information to potential investors and investors (Harahap, 2019).

Market growth opportunities are negatively related to Aac and ACFO. One possible reason might be, firms to take advantage of the growth opportunities invest heavily in research and development, marketing, etc. Therefore, they may not have as much leeway to manipulate its financial results through accruals or real earnings management, as these practices could be seen as detracting from the company's long-term growth potential. Added to this, to grab these growth opportunities firms need external financing for their expansion (which is subject to external scrutiny and covenants restrictions); they might find it optimal to improve their earnings opacity and minority shareholder protection if they could benefit from a lower cost of capital (Fernandes, 2007). Results are consistent with those AlNajjar & Riahi-Belkaoui, (2001).

Leverage has a negative and significant relationship with Aac and ADixp. One rationale of these findings is that Pakistani firms rely on bank loans, and any manipulation if detected will result in restrictive clauses and contracts by creditors and financial institutions. Since lenders impose strict monitoring, managers will have less room for opportunistic manipulation of the financial

statements. The results are consistent with Saona et al., (2018) and Samuel Baixauli-Soler et al., (2021).

Dividend per share is statistically significant with ADixp and AProd, indicating that in developing countries' financial environments, large institutional equity holders demand a smooth stream of dividends hence managers follow this implicit contract and are reluctant to cut dividends Ozo & Arun, 2019; Anglin et al. (2013). Dividend payments signal favorable information to the capital market, even though dividends are expensive because of their high taxation (Bhattacharya, 1979; Ross, 1977). To pay constant dividends, managers of Pakistani firms cut discretionary expenses such as R & D, administrative expenses, etc, and offer lenient credit terms to adjust their production costs, thereby establishing a credible reputation and easy access to external funds. These results are partially consistent with Hussain and Akbar, (2022) and Tran, (2020).

Taxes are inversely linked to AEM. Financial reporting that is more aggressive tends to be accompanied by aggressive tax reporting. This increases the gap between book income and tax income, which, in turn, leads to increased scrutiny by auditors. Further, if a company inflates its earnings through accruals earnings management, it may be subject to higher taxes on its reported income. This could reduce the net benefit of engaging in earnings management and may lead companies to avoid these practices. Badertscher, Phillips, Pincus, & Rego (2006) argue that firms use earnings management with tax consequences when their tax position reduces the cost of net operating loss carryovers, have sufficiently high free cash flow, and have a Big auditor. The findings are consistent with Dhaliwal and Wang, (1992) and Manzon, (1992).

Conclusion

This study highlights the significant factors affecting accruals and real earnings management. The data utilized for this study is taken from manufacturing firms listed on PSX during 2010-2021. The study's findings suggest that companies' size and profitability are critical factors in determining the degree of earnings management, whether it is through accruals or real earnings management. Market growth has a negative impact on the use of accruals and real earnings management. Furthermore, leverage has a negative correlation with the use of accruals and real earnings management, while dividend per share has a negative relationship with the use of adjusted discretionary expenses and adjusted production costs. Finally, tax payments have a negative impact on the use of accruals, but their effect is not significant in relation to the other three proxies. Companies can use these insights to improve their financial reporting practices and consider factors that may impact the degree of earnings management they engage in.

The findings of this study carry implications for policymakers, investors, and managers. regulators and policymakers should focus on monitoring the financial reporting practices of larger and more profitable companies. This can be done by implementing stricter regulations and oversight mechanisms that promote transparency and accuracy in financial reporting, such as increased disclosure requirements, enhanced auditor independence, and more robust enforcement mechanisms. Moreover, policymakers should encourage companies to adopt corporate governance practices that prioritize the interests of all stakeholders, not just shareholders. This can be achieved by promoting board independence, ensuring diversity on corporate boards, and encouraging greater engagement with stakeholders, including employees, customers, and communities. Such policies can help to mitigate the incentives for managers to engage in earnings management and promote long-term sustainable growth.

Finally, policymakers should also promote greater financial literacy among investors and the public to enhance their ability to assess the quality of financial reporting and identify potential instances of earnings management. This can be done through education and awareness campaigns, as well as initiatives to enhance financial reporting standards and practices. However, among the limitations of our findings is the limited generalizability, where the evidence is based solely on

one sector, the industrial, in one developing country. The generalizability of the study findings can be enhanced if the posited hypothesis is tested using different datasets from other developing countries and expanded to include other industry sectors. The study suggests new directions for future research to focus on how real earnings management can possibly disrupt supply chains. In addition, further research can add other variables to the tested model such as audit quality and corporate governance among other variables of anticipated effect to advance the understanding of the relationship between earnings management and firms' future profitability.

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