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RESEARCH PAPER

Accounting Manipulation and Weighted Average Cost of Capital: Detecting Earnings Management via Yoon and Miller (2006) Model: The Prospective of Pakistan

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ABSTRACT

This research has been carried out to investigate the potential correlation between accounting manipulation and the capital expenses of corporations listed on the Pakistan Stock Exchange (PSX). The study examines 80 non-financial companies listed on the PSX from 2008 to 2019. The researchers utilized the Dynamic Panel Generalized Method of Moments (GMM) for individual effects of indicators and analysis. To measure accounting manipulation, the Yoon & Miller (2006) model, Discretionary Accrual, is used as a proxy for earnings management. The researchers also incorporated four control variables: firm size, Return on Assets, Debt to Equity, and CEO Duality. The findings suggest an inverse relationship between discretionary accruals (DAC) and the Weighted Average Cost of Capital (WACC). That is to say, when DAC increases, WACC decreases. On the other hand, a positive association exists between non-discretionary accruals and WACC, indicating that managers may use non-discretionary accruals to inflate the company's earnings. The study highlights the need for greater regulatory attention to accounting manipulation, discretionary and non-discretionary accruals, and earnings management in non-financial listed companies in Pakistan and globally.

KEYWORDS Accounting Manipulation, Discretionary Accruals, Earnings Management, Non-Discretionary Accruals, Yoon & Miller Model

Introduction

The Earnings management engrosses manipulating financial results to maximize profits, which can lead to a decline in long-term corporate performance. Earnings management is using managerial discretion to modify financial reports to deceive stakeholders, indicating that top-level management is motivated to succeed (Aldamen & Duncan, 2013). Earnings management conceals true performance, making earnings less dependable for measuring performance—firms providing high-quality information engaged in fewer earnings management than those with low-quality information. Domestic IFRS has replaced GAAP globally, leading to an important decay in earnings management practices in many countries (Dichev & Dechow, 2001). implementing IFRS reduced earning management practices in Pakistan between 2001 and 2009; IFRS has not significantly impacted these practices in Pakistan for two reasons. First, Pakistan has been utilizing an IAS/IFRS-based system since inception, and Second, due to the consistency in data elements for measuring the efficacy of IFRS resulting from reason 1. Because accounting fraud is on the rise in the area, in Pakistan, researching earnings management would be highly advantageous to protect investors from exploitation and fraud (Maranjory et al., 2013). If executives are restricted from exerting personal influence, their motivation to hide company performance may decrease, leading to a potential decline in investor protection (Jensen & Meckling, 1976).

The article examines the function of earnings management through discretionary accruals and real activities, emphasizing the necessity of creating models that can differentiate between non-discretionary and discretionary components. The modified Jones model effectively identifies earnings management practices but may not be appropriate for Asian firms. Thus, the study utilizes the new model Yoon et al. (2006) suggested to examine the association between earnings management and WACC (Tulcanaza-Prieto & Lee, 2022).

It is important to understand earnings management and the cost of capital; companies aim to reduce costs and increase returns to maintain their value (Xing et al., 2022). A unique connection between the cost of debt, typically reflected in interest expenses and the cost of equity, is commonly seen in dividend payments (Andriamahery & Qamruzzaman, 2022). Low-cost companies practice more earnings management during bull markets. Reported earnings impact equity value, and solutions aim for accurate accounting information (Healy & Wahlen, 1999). The Securities and Exchange Commission's previous Chairman's trustworthy accounting standards help enhance investor confidence and, in turn, lower capital costs (Francis et al., 2005). Additionally, various empirical studies have indicated that firms that produce more accurate and informative financial reports generally experience reduced capital costs (Beyer et al., 2010). The importance of accounting accuracy in reducing capital costs and information risk. A study aims to investigate accounting manipulation's correlation with capital costs in Pakistan's listed companies. Policymakers can use this study's findings to address the alteration in financial reporting practices in Pakistan's listed companies (Ghazali et al., 2015).

Literature Review

Earnings management involves managers manipulating financial reports and transactions to alter financial reports to maximize their interests. This practice is often achieved through discretionary accruals, subject to management discretion, and non-discretionary accruals, based on objective events (Boll et al., 2022). Researchers have explored how managers manipulate reported earnings, arguing that discretionary accruals could be used to smooth or meet earnings targets. The practice of earnings management is a global issue (Alharasis et al., 2022). Agency theory suggests that conflicts of interest and information asymmetry may occur when managers make decisions on behalf of owners. Corporate disclosures, like financial reports, can mitigate these conflicts by providing information to increase transparency and decrease information asymmetry (Frino et al., 2022). Prior studies suggest that earnings are more effective indicators of forthcoming cash flows than operating cash flows since accrual accounting allows matching revenue and expenses across multiple periods (Biswas et al., 2022). In line with the principles of signalling theory, managers are driven to provide the stock market with more information to gain investors' confidence, increase the earning potential of their securities, and lower their capital expenditures (Saleh et al., 2023). Financial transparency helps to reduce information asymmetry and ultimately leads to lower capital costs for firms (Chen et al., 2023). However, some managers may engage in opportunistic behavior, such as earning management, to highlight their firm's positive long-term prospects and reduce the cost of capital by overemphasizing earnings during meetings (Buallay & Alhalwachi, 2022).

This statement highlights that prior studies have produced mixed findings in developed and developing countries on the link between earning management and the cost of capital (Zalata et al., 2022). The Australian market examined how accrual quality affects equity and debt costs (Khan et al., 2022). The researcher found that in Australia, companies' use of innate accruals positively impacted both equity and debt costs, but there was no significant impact from discretionary accruals. Inborn and discretionary accruals affected US companies' capital costs, while Australian companies' private financing reduced information asymmetry for private lenders. This decreases the information risk managers face concerning discretionary reporting and may aid in lessening its influence on debt expenses (Diantimala et al., 2022).

The correlation between inherent and discretionary accruals and the pricing of Australian corporate debt. Their conclusions reinforced prior research demonstrating that greater inherent accruals are associated with increased loan costs. In line with the principles of signalling theory, Managers are motivated to provide the stock market with more information to gain investors' confidence, increase the earning potential of their securities, and lower their capital expenditures (Irshad, Khan et al., 2022). The results showed that innate factors of accrual quality had a greater impact than discretionary factors on accrual quality, indicating the business environment's inherent characteristics of firm accrual quality in Kenya (Liu et al., 2022). In contrast to previous research, Candra and Ekawati (2016) found that manufacturing firms in Indonesia were only affected by discretionary accruals, indicating investors may not recognize the effects of accounting manipulation on reported earnings. Patro and Kanagaraj (2016) found that earning management significantly impacts capital cost in India, with discretionary accruals having a greater effect than non-discretionary accruals. This suggests that companies may manipulate accounting to increase profits and reduce capital costs.

Subramanyam (1996) suggested that investors may not be aware of earnings management using discretionary accruals. It was found that companies engaging in earnings management in Pakistan face higher capital costs due to the erosion of public trust, leading to a higher rate of return demanded by investors (Nobanee & Ellili, 2022). Cyril et al. (2019) conducted a study on Nigerian companies to examine the opportunistic behavior of managers in manipulating results and stock values. Furthermore, Khalid et al. (2015) discovered that favorable discretionary accruals might result in a positive market appraisal without resorting to opportunistic earnings management when the market is efficient. Ghazali et al. (2015) investigated the correlation between opportunistic actions, such as free cash flow and profitability, and earnings manipulation (Irshad et al., 2023). They discovered an affirmative connection between profitability and earnings manipulation. Subramanyam (1996) and Demirkan et al. (2012) have researched the connection between share price fluctuations and discretionary accruals and argued that managers might use discretion in accounting to manipulate earnings and increase the capability to reflect real values, causing the pricing of discretionary accruals (Obaid et al., 2022). On the other hand, Demirkan et al. (2012) have studied the impact of discretionary accruals on multi-segment companies' cost of capital versus single-segment businesses. The researchers concluded that businesses with multiple segments have greater capital expenditures for the same discretionary accruals quality than those with only one segment. The link between earning management and the cost of capital. He revealed that the cost of capital increases with more financial manipulation reporting, and this relationship is affected by the level of managerial ownership and enforcement (Waqas Balooch et al., 2015). Companies handle earnings through discretionary accruals (DAC) and non-discretionary accruals (NDAC). They found that high-variation companies use additional discretionary accruals compared to low-variation enterprises (Irshad, Hussain, et al., 2022).

H1: There is a significant statistical effect of discretionary accruals on the weighted average cost of capital.

H2: There is a significant statistical effect of non-discretionary accruals on the weighted average cost of capital

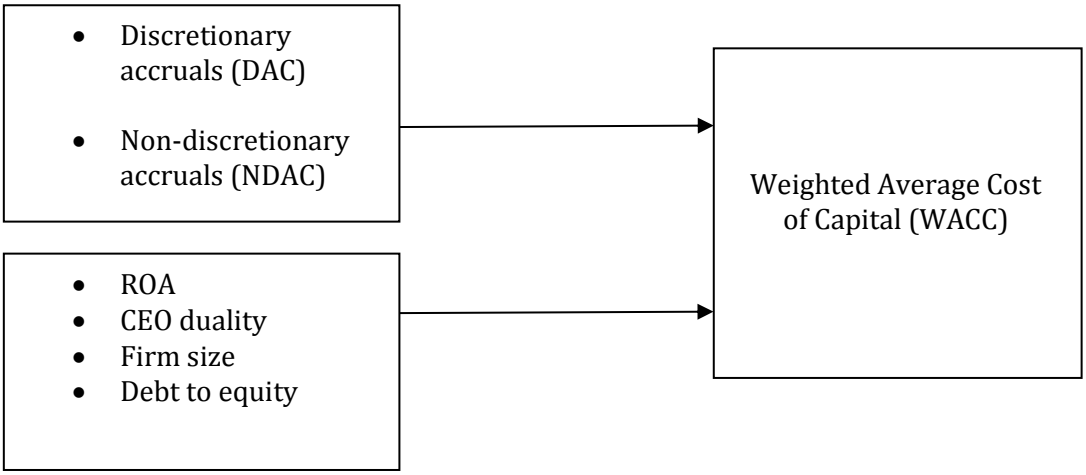
Accrual as a Proxy of earnings manipulation

Researchers focus on accounting method selection and accrual management to identify earnings manipulation. Accrual models are preferred as they capture subtle income management methods (Miller et al., 2023). Discretionary accruals are the focus of earnings management, but differentiating between discretionary and non-discretionary accruals is crucial. Distinguishing between them is challenging as accruals include all adjustments for moving from cash to an accrual basis, including working capital changes (Ghosh & Moon,

2010). The Jones model is the commonly used technique to distinguish discretionary and non-discretionary accruals, which enables the segregation of these two types of accruals. The modified Jones model is a modified version of the standard Jones model that accounts for changes in sales and receivables to decrease measurement errors in discretionary accruals. The modified Jones model is recommendeds the most effective method to estimate earnings management compared to other models (Canbaloglu et al., 2022). Yoon et al. (2006) discovered inappropriateness in the modified Jones model for evaluating discretionary accruals in Asian companies. Focus has been seen in earlier studies on the effectiveness of discretionary accrual models but not on performance-matched accrual models (Ibrahim et al., 2014).

H3: Yoon & Miller's (2006) model is a better-detecting method to detect earnings manipulation in Pakistan.

Conceptual Framework



Material and Methods

Sampling Selection Technique

The study investigates the association between earnings manipulation and WACC through empirical research. The sample comprises 80 non-financial firms selected from 200 listed companies on the Pakistan Stock Exchange (PSX) between 2008 and 2019, with certain data and sample limitations being applied. The study used Roscoe's (1975) and Abranovic's (1977) rule of thumb for sample size selection. According to the researchers, sample sizes larger than 30 and less than 500 are adequate for most research. Hosmer and Lemeshow (1989) suggest a minimum of 10 samples per independent variable is needed. As the study has five independent variables, a minimum of 40 companies is required.

Measurement of Accruals

Discretionary accruals are used as an alternative measure in determining the degree of earnings management. They are calculated by deducting non-discretionary accruals from the overall amount. A regression model approximates non-discretionary accruals by evaluating the total accumulations based on various explanatory factors. However, one significant limitation of the total accrual method is that it fails to differentiate between discretionary and non-discretionary components. Thus, developing a model to distinguish discretionary accruals from the total is necessary. Earlier research has shown that the modified Jones model (Dechow et al., 1995) is useful in achieving this goal. Nonetheless,

recent research by Yoon and Miller (2002b) and Yoon et al. (2006) indicates that the Jones-modified model is unsuitable for Asian companies.

Model of Accruals

Total accruals (TACC) can be calculated through a balance sheet approach, that is:

$$TACC = (\Delta CA - \Delta CASH - \Delta CL + \Delta STDEBT - DEPN \quad \text{Equation (1)}$$

Where in,

TACC is the Total accrual
ΔCA is the change in current assets
ΔCL is the change in current liabilities
ΔCASH is the change in cash in hand
ΔSTBEBT is the change in short-term debt
DEPN is the depreciation

This research employed the newly proposed model by Yoon et al. (2006). The model is described in Equation 2:

$$TAi = \beta 0 + \frac{\beta 1(\Delta REVi - \Delta RECi)}{REVi} + \frac{\beta 2(\Delta EXPi - \Delta PAYI)}{REVi} + \frac{\beta 3(DEPi + RETi)}{REVi} + \epsilon i \quad \text{Equation (2)}$$

Where

TA is the Total Accrual
Rev is the net sales revenue
Rec is the receivables

Expense is the sum of the cost of goods sold and selling and general administrative expenses excluding non-cash expenses.

Pay is the payables
Dep is the depreciation expenses
Ret is the retirement benefits
Δ is the change operator

The theory suggests that the total accruals rely on changes to cash sales revenue, cash expenditures, and non-cash expenditures like depreciation and retirement benefits costs. To calculate the discretionary accruals, non-discretionary accruals will be deducted from the whole accruals for every observation in equation (2), as shown below:

$$DAi = \frac{TAi}{REVi} - [\beta 0 + \frac{\beta 1(\Delta REVi - \Delta RECi)}{REVi} + \frac{\beta 2(\Delta EXPi - \Delta PAYi)}{REVi} + \frac{\beta 3(DPEi + RETi)}{REVi}] \quad \text{Equation (3)}$$

And Finally, DAC is calculated dissimilarity between Total accruals and Non-discretionary accruals.

$$DACi, t = \frac{TAi,t}{Ai,t-1} - NDACi, t \quad \text{Equation (4)}$$

Model of WACC

We calculate WACC as mentioned below:

$$WACC = \left(\frac{Lt}{Lt} + Et\right) * Kd(1 - t) + \left(\frac{Et}{Lt} + Et\right) * Ke \quad \text{Equation (5)}$$

Where,

Lt is the total interest expense overtime-period t;
Et is the shareholder equity overtime-period t;
Kd is the interest rate calculated overtime-period t;
Ke is determined following the Gordon model:

$$Ke = [\frac{Do(1+g)}{Po}] + g \quad \text{Equation (6)}$$

Where,

Do is the prior year's dividend earned per share;
Po is the share value at the start of the period t;
g is the earnings growth rate.

Operationalization

Variables	Acrimony	Measurement	Source
Earnings Management			
Discretionary Accruals	AEM	Discretionary accruals from the Yoon et al. (2006) model	State Bank of Pakistan
WACC			
Weighted Average Cost of Capital	WACC	To calculate as per Eq (5) and Eq (6)	Annual Report
Control Variables			
CEO duality	ceo_duality	Dummy variable coded one if the CEO is also the chairman of the board and zero otherwise.	Annual Report
Leverage	D_Equity	Debt to Equity Ratio/Interest Coverage Ratio	Annual Report
Firm Size	FZ	Natural log. Of total assets	Annual Report
Return on Assets	ROA	Net Income / Total Assets	Annual Report

Econometric Model

The regression model is utilized to test the hypothesis conducted on a whole sample as are under:

$$WACCit = \beta o + \beta 1DACi,t + \beta 2ROAi,t + \beta 3Fsizei,t + \beta 4Debt\ to\ equityi,t + \beta 5CEOdualityi,t + ei,t \quad \text{Equation (7)}$$

$$WACCit = \beta o + \beta 1NDACi,t + \beta 2ROAi,t + \beta 3Fsizei,t + \beta 4D\_equityi,t + \beta 5CEOdualityi,t + ei,t \quad \text{Equation (8)}$$

Where,

The subscripts "I" and "t" denote firm and year;

WACC (Weighted average cost of capital);
DAC (Discretionary accruals);
NDAC (Non-discretionary accruals);

ROA (Return of assets);
Fsize (Firm size);
D_equity (Debt to equity); and
CEO_daulity (CEO duality).

Results and Discussion

Descriptive Analysis

Table 1 presents statistical data on all variables employed in the study, but only specific variables were examined in detail to maintain brevity. The variables in the table have varying means, covering a wide range. The sample used in the study was designed to have sufficient variance and reduce the likelihood of a biased sample. The mean DAC, NDAC, and WACC results are -0.1174, 0.0048and 0.091, respectively. A zero value for accrual indicates using an income-smoothing technique, while a positive number suggests income-increasing accounting manipulation. A negative number indicates income-decreasing earnings management, as Sulistyanto (2008) stated.

Table 1
Descriptive Statistics

Variables	Mean	Median	Maximum	Minimum	Std. Dev.	Skewness	Kurtosis
WACC	0.092108	0.07079	1.151383	-2.494814	0.131334	-6.36015	168.9931
DAC	0.117764	0.042709	12.2587	-2.328784	0.700756	8.150811	117.8158
NDAC	0.000485	-4.12E-05	0.224364	-0.003899	0.008739	22.28936	527.935
ROA	0.068451	0.052343	1.228215	-0.373996	0.130338	1.877374	17.79816
F_SIZE	2.938015	3.07	3.71	0.41	0.499577	-1.646434	6.71361
D_EQUITY	2.075814	1.098051	795.7	-524.8946	31.86041	11.8085	490.1582
CEO_DUALITY	0.078556	0	1	0	0.269188	3.132887	10.81498
Observations	942	942	942	942	942	942	942

Note: N = 80 non-financial companies were selected, and 942 observations.

Pearson Correlation Result

Correlation analysis assesses the level of association between two variables and detects multi-collinearity. Pearson correlation coefficient is commonly used, ranging from -1 to +1. A coefficient below 0.80 indicates no multi-collinearity, confirmed by Table 2 in the research by Bassiouny et al. (2016) and Soliman (2013). Table 2 displays the correlation matrix outcomes for the independent variables, demonstrating that not all independent variables in the dataset have multi-collinearity problems, as all coefficients are below 0.80.

Table 2
Correlation matrix

	WACC	DAC	NDCC	ROA	F_SIZE	D_EQUITY	CEO_ DUALITY
WACC	1						
DAC	-0.005377	1					
NDAC	-0.025703	-0.010964	1				
ROA	0.167696	0.056932	-0.031045	1			
F_SIZE	-0.09029	0.049196	0.015742	0.033664	1		
D_EQUITY	0.002409	0.008364	-0.006968	-0.020989	-0.086098	1	
CEO_DUALITY	0.007392	-0.022398	0.011023	-0.098452	-0.214176	0.089188	1

Main Results Analysis

Table 3 displays the results of a study that inspects the connection between the weighted average cost of capital (WACC) and two independent variables: DAC and NDAC. The study also considers the impact of several other factors, such as return on assets, firm size, debt to equity, and CEO duality. The study employs a dynamic panel model using the Arellano-Bond method. This method accounts for the lagged values of the dependent variable (WACC) and the potential influence of industry and annual factors on the independent variables. Overall, the findings in Table 3 suggest that the independent variables (DAC and NDAC) have a statistically significant influence on the dependent variable (WACC) after controlling for the other factors. The results also indicate that the lagged values of WACC and industry and annual factors play a role in the association between independent and dependent variables.

Table 3
Arellano Dynamic Panel models for 1 and 2

Variables	**Model 1**			**Model 2**		
	Coefficient	Std.Error	Probability	Coefficient	Std.Error	Probability
Lagged Variable	0.127221***	0.001192	0.0001			
				0.124581***	0.001067	0.0001
Discretionary accruals	-0.001529***	0.000635	0.0163			
Non-discretionary accruals				0.089344***	0.006739	0.0001
Return on Assets	0.092546**	0.007884	0.0001			
				0.089344**	0.006739	0.0001
Firm Size	-0.062671***	0.00227	0.0001			
				-0.064401***	0.002524	0.0001
Debt to equity	0.0000374***	0.00018	0.0437			
				0.0000345***	0.0000174	0.0481
CEO duality	0.006434***	0.005487	0.2414			
				0.018441***	0.006193	0.0031
Industry Effect			Yes			Yes
Arellano Bond Serial Correlation						
AR(1)			0.2204			0.4935
AR(2)			0.2187			0.3993
J_statistics			61.51269			61.22165
Prob (J-statistic)			0.3935			0.232799

NoNote: All statistical siNote: All variables are significant, as shown by the symbols ***, **, and *at 1%, 5%, and 10%, respectively.

In line with Hypothesis No 1 in Table 4: Discretionary accruals can significantly negatively impact a firm's Weighted Average Cost of Capital (WACC). Specifically, higher discretionary accruals appear to reduce a firm's WACC. Discretionary accruals refer to the estimated changes in a company's earnings that are made at the discretion of management. Based on empirical results, we propose that managers may be involved in earning management activities to create an undervaluation of the company's stocks, which can lead to a lower WACC (Akhter, 2023). This can be accomplished by overstating earnings at the time of a meeting, which can highlight the company's valued information about the long-term prospects and, in turn, reduce the cost of capital. It's worth noting that some managers might engage in opportunistic behavior when manipulating earnings to drive down the cost of capital. This could potentially have negative implications for investors and other stakeholders. However, it's important to acknowledge that discretionary accruals can also be used for legitimate purposes, such as to smooth out earnings over time by manipulating according to reports (Wang et al., 2022). It is not uncommon for different studies to produce conflicting results, as various factors such as sample selection, data sources, and methodological approaches can influence the outcomes. In this case, the results cited in the

previous paragraph suggest an adverse connection between discretionary accruals and WACC, while the studies referenced in this statement suggest either a positive relationship or no correlation. The study by Francis et al. (2005) established an affirmative association between discretionary accruals and WACC, which differs from the negative relationship suggested (Ali et al., 2022). on the other hand, found no significant correlation between discretionary accruals and WACC. It's important to note that each study may have different data sets, variables, and methodologies, which could explain the discrepancies in their results. Therefore, it is advisable to consider the findings of multiple studies when concluding the relationship between discretionary accruals and WACC and to exercise caution when generalizing the findings from any single study (Abbassi et al., 2022).

As per Hypothesis No. 2, non-discretionary accruals (NDAC) favourably impact the Weighted Average Cost of Capital (WACC) companies publicly listed on the Pakistan Stock Exchange. The discovery aligns with earlier studies by Francis et al. (2005), Gray et al. (2009), and Aldamen and Duncan (2013). The authors propose that managers may be able to manipulate NDAC to artificially inflate earnings, which can lead to higher capital costs for the company (Majeed & Yan, 2022). It's important to note that NDAC refers to the estimated changes in a company's earnings that are not at the discretion of management and are instead based on factors such as alterations in the market value of assets or liabilities. However, the findings of this study appear to oppose the results of a prior study by Candra and Ekawati (2016), which found no significant influence of NDAC on capital costs. It's possible that differences in the sample, methodology, or other factors could have contributed to the divergent results. Overall, it's important to consider multiple studies when evaluating the relationship between NDAC and WACC and to be cautious when drawing conclusions established on the findings of any single study (Tarighi et al., 2022).

However, a firm's size can significantly affect its weighted average cost of capital (WACC). Generally, larger firms have lower WACCs because they can access capital markets more easily and at a lower cost due to their size and reputation. Larger firms are often perceived as less risky and more stable than smaller ones. As a result, lenders and investors may be more willing to provide them with funding at a lower cost. The finding you mentioned supports this idea, as they found that large corporations can acquire funding at the lowest potential cost (Prabhawa & Harymawan, 2022). It is crucial to note that the bond between control variables like ROA and Debt to equity with WACC may vary depending on the company's specific context and industry. In general, however, a higher ROA and lower Debt to equity ratio can indicate a company's financial health and stability, which may result in a higher WACC (Lee, 2022). Regarding the relationship between a company's growth trend and the precision of public disclosure, a company with a declining growth trend may have difficulty providing accurate and timely information (Pan et al., 2023). This could be due to several factors, such as reduced resources or a shifting focus toward internal operations. However, companies must prioritize transparency and accurate disclosure regardless of their growth trend, as this can help maintain investor trust and facilitate informed decision-making.

Table 4
Hypothesis Results

S.No	Hypothesis	Results	Accepted / Rejected
H1	There is a significant statistical effect of discretionary accruals on the weighted average cost of capital.	Coeff = -0.001529, $p<0.05$	Accepted
H2	There is a significant statistical effect of Non-discretionary accruals on the weighted average cost of capital.	Coeff = 0.089344, $p<0.05$	Accepted

H3	Yoon & Miller's (2006) model is a better-detecting approach to detecting earnings manipulation in the context of Pakistan.	J_Stat = 61.521, 61.221; p>0.05 respectively	Accepted

Source of result pattern Najjar, N. (2012).

Conclusion

The paper investigates the association between earnings management (EM) and Weighted average cost of capital (WACC) in 80 companies listed on PSX from 2008 to 2019. Discretionary accruals (DAC) were negatively and significantly correlated with WACC, while non-discretionary accruals (NDAC) were positively and significantly correlated. Regulations can mitigate incentives for EM by enforcing proper standards and transparency obligations. The Yoon & Miller model (2006) effectively detects EM in Asian firms, and further studies could be conducted on this model. The study has significant regulatory implications for addressing EM in financial reporting.

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