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Creators	Khaled, Bubaker and Ali-Aribi, Zakaria

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The Impact of Corporate Governance and Accruals Flexibility on the Interaction between Earnings Management Strategies

Abstract

This study examines the impact of corporate governance mechanisms and accruals flexibility on the interaction between accruals earnings management (AEM) and real earnings management (REM) using a large sample of Indian firms for the period 2007–2015. The results show significant impact of board effectiveness, audit committee effectiveness, high auditor's quality and accruals flexibility on the level of AEM, and also we find significant relations between the level of REM and AEM, suggesting that managers may switch from AEM to REM when they find constraints on AEM. Additional analysis of firms with relatively strong earnings management incentives confirms the trade-off between AEM and REM. Our findings are also robust to the alternative measure of earnings management.

Key words: accruals earnings management; real earning management; corporate governance mechanisms; India.

1.Introduction

Earnings management (EM) can take the form of accruals earnings management (AEM) as well as real operating decisions, referring to real earnings management (REM). AEM occurs when managers violate or exploit the flexibility in the GAAP to improve earnings (Alhadab et al., 2016). The manipulation of earnings in this case is based on the selection of particular choices of accounting methods and policies, thus causing contradiction between the timing of the accounting recognition of income and the timing of cash flows (Ronen and Yaari, 2008; Shafer, 2015).

The REM significantly differs from AEM as it has a direct impact on the cash flow. The REM defined as management actions that deviate from normal business practices, undertaken with the primary objective of meeting specific earnings thresholds (Roychowdhury, 2006). It has a direct impact on the cash flow as it manipulates the real business activities and influencing earnings through decisions in the firm's daily operations in order to obtain targeted earnings. Manipulations of real activities include influencing earnings through decisions in the firm's daily operations in order to obtain desirable results (Roychowdhury, 2006). It contains several additive components, namely discretionary expenses, cash-flows and production costs (Roychowdhury, 2006; Cohen and Zarowin, 2010).

Prior studies documented that the increased scrutiny on EM have led to an overall reduction in AEM (e.g. Cai et al., 2008; Chen et al. 2010; Sun et al., 2011). Managers presumably realise that the costs and risks of detecting EM are higher than its benefits in a stronger regulatory environment. Cohen and Zarowin (2010) noted that REM is more difficult to detect than AEM. Although REM has not been studied on as large a scale as AEM, it has been argued that managers may prefer to use REM than AEM (Ewert and Wagenhofer, 2005). One important gap in the previous studies is related to the determinants of the trade-off between AEM and REM. The current study examining the effects of corporate governance mechanisms and accruals flexibility on the trade-off between AEM and REM, it also extends the EM literature by providing empirical evidence of substitution of EM strategies in India as an emerging economy context. Using a sample containing 1908 firm-years over the period 2007-2015 from Indian stock market, the results show that AEM is constrained by board effectiveness (BEF), audit committee effectiveness, high auditor's quality (Big4) and accruals flexibility (AC_FL). The results also indicate a negative and significant relations between the level of AEM and REM, suggesting that managers practice the trade-off between the two approaches based on

constraints and flexibility related to AEM. Our findings are robust to the alternative measure of earnings management.

We focus on India as the world's second fastest-growing large economy and one of the fastest growing emerging markets. Indian listed firms exhibit strong presence of family and promoter groups' ownership (Chauhan et al. 2016), it is also a fact that Indian institutional laws, mechanism and governance are weak compared to Western countries (Reddy, 2016). Therefore, research findings for Western countries may not be applicable for Indian context. This study contributes to the literature in several ways. Firstly, it sheds light on managerial preference between AEM and REM by examining whether the constraints and accruals flexibility related to AEM has an impact on managements' decisions about REM. We provide evidence that management preference between EM strategies is based on constraints and the flexibility found by the company. We also extend the EM literature by providing empirical evidence of substitution of EM strategies in an emerging economy context, through examining the effects of corporate governance mechanisms and accruals flexibility on the trade-off between AEM and REM.

The remainder of the paper is organized as follows. Section 2 develops the literature background. Section 3 is a description of the research method used in the paper while Section 4 reports the empirical results. The final sections present the main discussion and implications.

2.Literature Review and hypotheses development

In the last few decade earnings management has become a major concern among investors, practitioners, regulators and scholars and has received considerable attention in the accounting literature, especially since the revelations of massive accounting scandals involving large corporations (e.g. Enron, WorldCom, etc.). Due to the existence of agency conflict, managers engage in EM opportunistically for their own interests rather than optimising the company's value, and consequently mislead investors about the company's financial position and market value. Belgacem & Omri (2015) showed that managers (agents) might exploit the flexibility of accounting principles in estimating their reward. Companies could face serious problems because of the ease with which the manager can access the company's information compared to the shareholders. Therefore, due to the existence of agency cost, accountability and transparent systems should be introduced to mitigate this problem (Leftwich, 1980; Watts & Zimmerman, 1990). Indeed, the practice of EM decreases the quality of financial reporting

because the information in the financial reports does not reflect the underlying economic conditions of a firm (Almahrog et al., 2018). Previous research argues that examining each EM strategy (AEM and REM) individually is inadequate to capture the impact of EM, (e.g. Fields et al., 2001; Ipino and Parbonetti, 2017; Ho, L. et al., 2015; Ferentinou and Anagnostopoulou, 2016). The prior literature also indicates that managers can use a mix of EM methods (i.e. AEM and REM) to meet their target (e.g. Zang, 2012; Sellami et al., 2016). Although REM has not been studied on such a large scale as AEM, Graham et al. (2005) documented strong evidence that managers may prefer to use REM instead of AEM. In particular, they interviewed 400 executives and emailed the survey to 3174 financial executives in the USA. Their findings indicate that eighty percent of survey participants are inclined to use REM through decreasing advertising expenses, maintenance and R&D rather than applying the accruals options in order to meet specific aims. In support, Roychowdhury (2006) investigates earnings management through real activities manipulation using a large US sample over the period 1987–2001. He finds higher levels of REM across different earnings thresholds and, more specifically, provides evidence that US companies engage more in REM to avoid reporting losses. However, the managers' decision to engage in any EM strategy will be influenced by how constrained and costly this strategy is. Managers will face different levels of constraints for each strategy, which will influence their decision. When the constraints of using one EM method are high, managers are more likely to substitute to the less costly alternative to manipulate earnings. Thus the relative degree of AEM vis-a-vis REM relies on the relative costs of each strategy. Therefore, the current study makes the main proposition as followings:

H1: There is a negative relationship between AEM and REM.

The board of directors is considered to be a fundamental part of the company's monitoring mechanism (Fama & Jensen, 1983). They monitor management by ensuring that executive managers fulfil their duties in a manner that serves the interests of shareholders (Fama and Jensen, 1983). Thus, board effectiveness is predicted to lead to a higher level of reliability and transparency of financial reporting (McElveen, 2002; Turley & Zaman, 2004). The effectiveness of the board's monitoring activities depend on how the board is structured and organised. Firms with non-optimal board structure may increase the agency costs (Weir et al., 2005). According to agency theory, the proportions of independent directors, board meetings, duality of CEO and board size are likely to have the most impact on the effectiveness of the

board (Zaman et al., 2011). Combining the impact of all board effectiveness characteristics together as an empirical proxy for board effectiveness will improve its suitability as a construct when examining board effectiveness (Zaman et al., 2011). This would also limit managerial opportunism behaviour of AEM (Fama 1980; Fama and Jensen 1983). In addition, the board effectiveness is an important factor for effective monitoring and improving the quality of financial reporting (Klein (2002)). Based on the above discussion, we make the second hypothesis as following:

H2: When companies are facing higher cost of AEM through the board effectiveness they will substitute from AEM to REM.

The audit committee is intended to play a major part in enhancing the financial reports' integrity (Allegrini and Greco, 2013). According to DeZoort et al. (2002), the audit committee has the purpose of protecting shareholders' interests, which is achieved by choosing qualified members who have adequate authority and the necessary resources to diligently offer oversight. The effectiveness of the audit committee's monitoring depend on how the it is structured. Prior studies document evidence that audit committee characteristics have a negative relationship with AEM (e.g. Klein, 2002; Sun et al., 2010). The audit committee is also intended to play a major part in enhancing the financial report's integrity (Allegrini and Greco, 2013). Parker (2000) found a negative association between the degree of independence of audit committees and AEM. Klein (2002) finds the magnitude of annual discretionary accruals is negatively related to audit committee independence. Bedard et al. (2004) documented that the existence of high discretionary accruals is negatively related to 100 percent active independent audit committees. Hence, we formulate the third hypothesis as following:

H3: When companies are facing higher cost of AEM through the audit committee effectiveness they will substitute from AEM to REM.

Previous studies provide evidence that Big 4 audit companies constrain AEM (e.g., Krishnan, 2003; Francis & Wang, 2008). Following prior studies, we consider Big 4 as a proxy for auditor scrutiny and measure it as an indicator variable that equals one if the firm auditor is one of the Big 4, and zero otherwise. Prior research suggests that large audit firms provide higher quality audits than small firms (e.g., Geiger and Rama, 2006; Khurana and Raman,

2004). It is also argued that companies audited by larger auditing firms have lower amounts of estimated abnormal accruals (Francis et al., 1999). Van Tendeloo & Vanstraelen (2011) show that Big 4 audit firms as high quality auditors provide a constraint on earnings management. Based on the above discussion, we make the fourth hypothesis as following:

H4: When companies are facing higher cost of AEM through higher quality of big 4 auditing firms, they will substitute from AEM to REM.

Besides scrutiny from corporate governance mechanism and auditing firms, the accounting system's flexibility within the companies also constrains AEM. Managers who face limited flexibility in the accounting system are more likely to face a higher risk of being detected. Thus, they are more likely to focus on other EM method such as REM. Abernathy et al. (2014) examined the relationship between the flexibility of the accounting system and AEM in the US companies and found evidence that the flexibility of accounting is positively related to AEM.

Following prior studies (Zang, 2012; Abrnathy, 2014), the current study employs the length of operating cycles as proxy of accounting flexibility. We argue that longer operating cycles lead to greater flexibility for accounting system, since they have a longer period for accruals to be reversed. Thus, we state the following prediction:

H5: When companies are facing higher cost of AEM through lower flexibility of accounting system, they will substitute from AEM to REM.

3. Research design

3.1 Sample for the study

Our initial sample for the study is the Bombay Stock Exchange (BSE) 500 from 2007 to 2015. However, we have removed the regulated financial industries and state controlled companies due to their unique characteristics and specific regulations which may affect the results (DeFond & Jiambalvo, 1994; Klein, 2002). Furthermore, foreign listed companies are excluded since they are influenced by different regulations from outside India. Firms with missing data have also been removed from the initial sample. The final sample consists of 1908 firm-year observations during the study period. Table 1 summarises the distribution of the final sample.

Table 1 Sample Selection

Type of sector:	Excluded companies						Total final sample	
	Population of study	Financial companies	Foreign Companies	Government Controlled Companies	Established after 2006	Missing data	Companies	Observations
Financial companies	94	94	-	-	-	-	0	0
Oil & Gas companies	48	-	11	8	2	6	21	189
Services companies	79	-	13	7	6	11	42	378
Agriculture & Fishing	24	-	4	1	2	3	14	126
Clothes companies	22	-	0	0	3	5	14	126
Automobile companies	17	-	5	0	0	0	12	108
Construction companies	48	-	13	2	4	7	22	198
Trading companies	20	-	0	0	1	4	15	135
Pharmaceutical and healthcare companies	42	-	2	0	1	8	31	279
Metals & Mining	27	-	0	12	2	4	9	81
Food and Drinks	29	-	3	3	3	6	14	126
Equipment companies	18	-	14	10	1	7	18	162
Total	500	94	65	43	25	61	212	1908

3.2 Detecting AEM.

Following previous literature (e.g. Islam et al., 2011; Collins, 2016; Hong, 2017), we employed the Modified Jones model (Dechow et al., 1995) to estimate current discretionary accruals DA. The following cross-sectional regression equation is used to estimate current accruals:

The cross-sectional Modified Jones Model (1995):

$$TAC_{it} / A_{it-1} = \alpha (1 / TA_{it-1}) + \beta_1 (\Delta REV_{it} - \Delta REC_{it}) / A_{it-1} + \beta_2 (PPE_{it} / A_{it-1}) + \varepsilon_{it} \quad (1)$$

Where:

TAC_{it} = total accruals

TA_{it-1} = the book value of total assets of company i at the end of year t-1

ΔREV_{it} = revenues of company i in year t deducted revenues in year t-1

ΔREC = change in accounts receivables scaled by TA_{it-1}

PPE_{it} / TA_{it-1} = gross property, plant and equipment of company i at the end of year t scaled by TA_{it-1}

α, β_1, β_2 = estimated parameters

ϵ_{it} = the residual.

We then employed the coefficient estimates from equation (1) to calculate normal accruals (NA_{it}) for every firm-year observations in the sample:

$$NA_{it-1} = \alpha (1 / TA_{it-1}) + \beta_1 (\Delta REV_{it} - \Delta REC_{it}) / A_{it-1} + \beta_2 (PPE_{it} / A_{it-1}) \quad (2)$$

DA measured by the difference between TAC and the fitted NA.

3.3 Detecting REM

Following Roychowdhury (2006) we consider three metrics to develop our proxies for real earnings management activities: the abnormal levels of cash flow from operations, abnormal production costs and discretionary expenses. Previous literature (Cohen et al., 2008; Cohen and Zarowin, 2010; Zang, 2012) offers evidence of the validity of these three proxies suggested by Roychowdhury (2006).

Following Roychowdhury (2006) and Dechow et al. (1998), we express normal cash flow from operations as a function of sales and change in sales in the current period. To estimate the model, we run the following cross-sectional regression for every industry and year:

$$CFO_{it} / A_{it-1} = \alpha + \alpha (1 / TA_{it-1}) + \beta_1 (Sales_{i,t}) / A_{i,t-1} + \beta_2 (\Delta Sales_{it} / A_{i,t-1}) + \epsilon_{it} \quad (3)$$

Where

$CFO_{i,t}$ = cash flow from operations for the company i in the current year,

$A_{i,t-1}$ = the total assets in the previous year,

$Sales_{it}$ = the company's sales in a current year,

$\Delta sales$ = changes in the company's sales in the current year.

For every firm-year, abnormal cash flow from operations (ACFO) is the actual CFO minus the “normal” CFO calculated using estimated coefficients from the corresponding industry-year model and the firm-year's sales and lagged assets.

We defined Production costs as the sum of Cost of Goods Sold (COGS) and the change of inventory (ΔINV) for firm i in year t .

$$COGS_{i,t}/Assets_{i,t-1} = \alpha + \alpha (1/Assets_{i,t-1}) + \beta_1 (Sales_{i,t}/Assets_{i,t-1}) + \epsilon_{i,t} \quad (4)$$

$$\Delta INV_{i,t}/Assets_{i,t-1} = \alpha + \alpha (1/Assets_{i,t-1}) + \beta_1 (\Delta Sales_{i,t} / Assets_{i,t-1}) + \beta_2 (\Delta Sales_{i,t-1} / Assets_{i,t-1}) + \epsilon_{i,t} \quad (5)$$

Using above equations (4) and (5), we estimate the abnormal level of production costs (APROD) as:

$$PROD_{i,t}/Assets_{i,t-1} = \alpha + \alpha (1/Assets_{i,t-1}) + \beta_1 (Sales_{i,t}/Assets_{i,t-1}) + \beta_2 (\Delta Sales_{i,t}/Assets_{i,t-1}) + \beta_3 (\Delta Sales_{i,t-1}/Assets_{i,t-1}) + \epsilon_{i,t} \quad (6)$$

The third proxy is abnormal discretionary expenses (ADISX), which is estimated by using the following equation:

$$DISX_{i,t}/Assets_{i,t-1} = \alpha + \alpha (1/Assets_{i,t-1}) + \beta_1 (Sales_{i,t}/Assets_{i,t-1}) + \epsilon_{i,t} \quad (7)$$

Where $DISX_{i,t}$ = expenses such as advertisements, administration, R&D and sales expenses. All other variables are defined above.

Following Roychowdhury (2006) we multiply the ACFO and ADISX by -1 then add them to the APROD using the following equation:

$$REM = - ACFO - ADISX + APROD \quad (8)$$

The lower level of REM indicates a less level of earnings manipulations in real activities.

3.4 Corporate governance mechanism and accruals flexibility

We use corporate governance mechanism and accruals flexibility as types of constraints related to EM. The first constraint concerns scrutiny of auditors. We use Big4 as a relative cost related to AEM as Big4 are more experienced, and can invest more resources in auditing (Zhang, 2012). Secondly, we use audit committee effectiveness as a relative cost constraining AEM. In 2015 Indian code number (49) suggests characteristics for the audit committee effectiveness as following: two-thirds of the members in the audit committee should be independent directors; all audit committee members should be financially literate and at least one of the audit

committee member has financial expertise; audit committee should meet at least four times a year and audit committee is composed of at least three members. Thus, consistent with both previous studies (Smith, 2003; Zaman et al., 2011) and Indian code number (49), we consider the audit committee for the company i and year t is effective if it complies with all above conditions, and it will award 1 otherwise zero. Third, we employ board of directors' effectiveness as relative cost related to AEM. The Indian corporate code number (49) also suggest the four characteristics for the board effectiveness as following: the independent director account for at least fifty percent of the all board members; the chairman is a non-executive director; the meeting of board committee is at least four times a year and at least 8 members make up the board committee. Thus, consistent with both Zaman et al. (2011) and Indian code number (49), we consider the board of directors for the company i and year t is effective if it complies with all above conditions, and it will award 1 otherwise zero. Fourthly, the operating cycle is measured as defined by Dechow (1994), and is the addition of days' inventory outstanding, days' sales outstanding and days' payables outstanding.

3.5 Model specification

We examine the impact of the constraints related to AEM on the trade-off between the two EM strategies by employing panel regression analysis. The following two regressions with firm-year observations are estimated to test the impact of constraints on both earnings management methods individually and the probability of switch strategy between real and accruals-based EM during the period from 2007 to 2015. We follow prior research (Becker et al., 1998; Bowen et al., 2008; Sun et al., 2011; Zaman et al., 2011; Ferentinou et al., 2016), by controlling other factors that have a possible impact on AEM and REM.

such as firm size, leverage, profitability and growth.

$$AEM_{it} = \beta_0 + \beta_1 REM_{it} + \beta_2 Big4_{it} + \beta_3 BEF + \beta_4 ACEF + \beta_5 INSOW + \beta_6 AC_FL + \beta_7 SIZE + \beta_8 LEV + \beta_9 ROA + \beta_{10} GROWTH + e_{it} \quad (1)$$

$$REM_{it} = \beta_0 + \beta_1 AEM_{it} + \beta_2 Big4_{it} + \beta_3 BEF + \beta_4 ACEF + \beta_5 INSOW + \beta_6 AC_FL + \beta_7 SIZE + \beta_8 LEV + \beta_9 ROA + \beta_{10} GROWTH + e_{it} \quad (2)$$

Where:

AEM = accruals based earning management of company i and period t, AEM is used as dependent variable in equation (1).

REM = earning management using real activities of company i and period t, REM is used as dependent variable in equation (2).

β_0 = the constant

Big4 = the four audit firms with highest repetition.

BEF = board effectiveness.

ACEF = audit committee effectiveness.

INSOW = institutional ownership measured through the proportion of shares held by institutions.

AC_FL = accounting flexibility.

SIZE_{it} = size of companies, the natural logarithm of firms' assets. Company size is measured using its total assets

LEV = financial leverage, is measured as the ratio of total liabilities to total assets.

ROA = a proxy for a firm's profitability and it is measured as the ratio of the income from operation to total asset.

GROWTH = Growth ratio measured through the change of sale.

4.Descriptive statistics

Table 2 shows AEM has a mean of 0.045 and a standard deviation of 0.106, which is consistent with the mean reported by Sarkar (2008) in India and Zeghal (2012) in 15 European countries. Regarding REM, table 2 shows the mean of REM is 0.001. Table 2 also shows that the mean for the three individual proxies of real earnings management (ACFO, APROD and ADISX) are 0.0023, 0.0027 and 0.0029 respectively. These results are similar to the findings of Ferentinou (2016), who found that the mean values of ACFO, APROD and ADISX are 0.005, 0.002 and 0.003 respectively. The mean values of BEF and ACEF are 0.367 and 0.621 respectively. On average, 28 % of our firms are audited by the Big4 accounting firms. We also

find the average value of accounting flexibility measured as the number of operation cycle days is 49.8. Finally, the mean value of institutions ownership is 0.264.

Table 3 and 4 report the correlation the coefficients between independent variables. It shows that the highest correlation coefficient is between BEF and INSOW, which is 0.218. Thus, the correlation coefficients of all other study variables are less than the conventional thresholds and there is no multi-collinearity problem between the study independent variables.

Table 2 Descriptive statistics

Variable	Mean	Sd	p25	p50	p75
AEM	.045	.106	.007	.021	.049
REM	-.001	.128	-.037	.002	.048
CFO	-.0023	.107	-.037	-.002	.029
PROD	-.0027	.102	-.032	-.001	.025
DISX	-.0029	.113	-.043	-.003	.034
ROA	.112	.124	.041	.090	.15
SIZE	7.48	.663	7.00	7.39	7.8
GROWTH	.255	.325	.088	.189	.32
LEV	.546	.224	.392	.583	.71
BEF	.367	.482	0	0	1
ACEF	.621	.485	0	1	1
INSOW	.264	.155	.15	.24	.35
AC-FL	49.8	.602	9.6	28.6	67.8

Table 2 presents descriptive statistics for all variables used in this study. AEM = Discretionary accruals measured through employing modified Jones model. REM = combined proxy of real activities earnings management measured through employing Roychowdhury model (2006). Big4 = the highest 4 repetition of audit committee firms. ROA= profitability, measured through net income from operations divided by total assets. FSIZE= company size measured through the natural log of company's total assets. GROWTH= Growth ratio measured through the change of sale. LEV= leverage ratio measured through long-term debt scaled by total assets. INSOW = institutional ownership measured through proportion of shares held by institutions, BEF = board effectiveness explained in chapter four. ACEF= audit committee effectiveness, more explanation in chapter four, AC-FL= accounting flexibility.

* Significance at the 0.10 level, ** Significance at the 0.05 level, *** Significance at the 0.01 level

Table 3 correlation matrix for equation 1 (AEM is dependent variable).

	REM	Big4	Type	ROA	Size	Growth	Lev	INSOW	BEF	ACEF	AC-FL
REM	1.000										
Big4	-.015	1.000									
Type	.0093	-.141***	1.000								
ROA	-.09***	.0256	.045*	1.000							
Size	.009	-0.61***	-.074***	-.113***	1.000						
Growth	-.016	-0.002	-.035	.0127	.0091	1.000					
Lev	-.005	-.070***	.006	.071***	0.059***	-.0117	1.0000				
INSOW	-.071**	.0248	-.117***	-.025	-.060***	.0076	-0.0225	1.0000			
BEF	.020	-.018	-.042*	.045**	-.078***	-.032***	-.0089	-0.2185	1.0000		
ACEF	-.051**	-.014	.001	-.0106	.0183	-.0108	-0.006	-.087***	.098***	1.0000	
AC-FL	-.08***	0.0315	-.170***	-.107***	.099***	-.004	.059**	.0129	-.0133	-.006	1.0000

Table 3 reports the correlation coefficients between the independent variables. All variables are defined as in Table 2

* Significance at the 0.10 level, ** Significance at the 0.05 level, *** Significance at the 0.01 level.

Table 4 correlation matrix for equation 2 (REM is dependent variable).

	AEM	Big4	Type	ROA	Size	Growth	Lev	INSOW	BEF	ACEF	AC-FL
AEM	1.000										
Big4	-.066***	1.000									
Type	.0182	-.141***	1.000								
ROA	-.0487**	.0256	.045*	1.000							
SIZE	-.0480**	-0.61***	-.074***	-.113***	1.000						
GROWTH	-.052**	-0.002	-.035	.0127	.0091	1.000					
Lev	-.0114	-.070***	.006	.071***	0.059***	-.0117	1.0000				
INSOW	-.0359	.0248	-.117***	-.025	-.060***	.0076	-0.0225	1.0000			
BEF	-.121***	-.018	-.042*	.045**	-.078***	-.032***	-.0089	-0.2185	1.0000		
ACEF	-.066***	-.014	.001	-.0106	.0183	-.0108	-0.006	-.087***	.098***	1.0000	
AC-FL	.097***	0.0315	-.170***	-.107***	.099***	-.004	.059**	.0129	-.0133	-.006	1.0000

Table 3 reports the correlation coefficients between the independent variables. All variables are defined as in Table 2

* Significance at the 0.10 level, ** Significance at the 0.05 level, *** Significance at the 0.01 level.

5. Results

Table 5 presents the results of the trade-off between REM and AEM (i.e., Eqs. (9) and (10)). Table 5 indicates that AEM is significantly and negatively related to REM (coef = -0.402, $p < 0.01$), while REM is significantly and negatively associated with AEM (coef = -0.182, $p < 0.01$). Thus, the H1 of this study is accepted. This result is consistent to prior studies and supports the predictions of the trade-off between AEM and REM (see. e.g. Graham et al., 2005; Zang, 2012; Cohen et al., 2008). H2 to H5 predict that firms use relatively more REM when the constraints of AEM are higher. Table 5 shows that all of the constraints associated with AEM have significant coefficients with the predicted signs. In fact, our evidence suggests that when firms are constrained by the relative costs associated with AEM, they substitute it with REM. The coefficients on BEF, ACEF and Big4 (Coef = -0.0138, Coef = -0.0132, Coef = -2.015) are negative, indicating that these costs are more likely to constrain the company's ability to manage accrual based earnings, which provides support for H2, H3, and H4. Consistent with H5, the positive coefficient on accounting flexibility suggests that companies with shorter operating cycles are less likely to use AEM to manipulate earnings, thus use REM management more. Therefore, the H2 to H5 of this study are also accepted. Taken together, our results suggest that managers change their EM strategies from AEM to REM and based on the constraints related to AEM strategy.

Table 5 Results of panel regression of the relationship between AEM and REM

	AEM (1)			REM (2)		
	Coef	t	P> t	Coef	t	P> t
AEM/REM	-.402***	-11.53	0.001	-.182***	-11.53	0.001
Big4	-.201***	-27.40	0.001	.215***	19.72	0.001
ROA	-.080***	-4.25	0.001	-.063**	-2.25	0.031
Size	-.037***	-6.04	0.001	.003	0.43	0.216
Growth	.010*	1.94	0.061	-.003	-0.48	0.965
Type	.001	0.04	0.774	.013	0.89	0.352
Lev	-.017	-1.56	0.213	.021	1.32	0.350
AC-FL	.001***	4.31	0.001	-.001***	-3.03	0.003
BEF	-.013***	-2.97	0.010	.014**	2.14	0.033
ACEF	-.013***	-3.09	0.007	.011*	1.83	0.054
INSOW	.101	3.68	0.312	-.115***	-2.86	0.005

Table 5 reports the findings of the primary analysis examining the relationship between AEM and EM. All variables are defined as in Table 2.

* Significance at the 0.10 level, ** Significance at the 0.05 level, *** Significance at the 0.01 level

5.1 Suspect firm-years analysis

To increase the power of our test and obtain more confidence that the above results do represent the trend in EM practice, we also run the following analysis. We perform a cross-sectional analysis using a sub-sample of firms that are likely to have strong incentives to manage earnings. We argue that if associate costs related to AEM play a prominent role in determining how managers choose between the two strategies, then the trade-off between AEM and REM and the effect of their associated costs should be observed even for companies with strong incentives for earnings management.

We construct a range of company-years sub-samples with strong firm-level incentives for earnings management. Firstly, following Roychowdhury (2006) and Doukakis (2014), we create a sub-sample of firm-years with small positive earnings (SPE), defined as firm-years that report net income from operation over lagged total assets higher than or equal to zero but less than 0.005. Prior studies provide evidence that these firms are likely to manipulate their earnings to report income marginally above zero (see. e.g. Cohen et.al. 2008; Doukakis, 2014). Secondly, we identify firm-years with changes in net income before extraordinary items (SEC) scaled by total assets which lies in the interval (0, 0.005), since it is likely that these firms, during these years managed their earnings in order to meet prior years' earnings numbers (Graham et al., 2005; Cohen et al., 2008). Thirdly, recent research has suggested that meet/beat analyst forecast is considered as a significant benchmark for management and they are likely to manipulate earnings to achieve this benchmark (Burgstahler and Dichev 1997; DeGeorge et al. 1999; Cohen et al., 2008). Thus, we focus on firm-years that have a small error in analysts' forecast (SEAF), defined as the differences between actual earnings per share reported in financial statements and the earnings per share forecast by analysts. Finally, we focus on high-debt firms (HDF), defined as firm-years that their leverage fall above the median value of the sample. This definition is consistent with evidence in prior research that highly leveraged firms have strong incentives to engage in EM (Doukakis, 2014). Table 6 presents the empirical findings for the four suspect samples indicating that all of the constraints associated with AEM have significant coefficients (at least at the 0.05 level) with the predicted signs which supports the main results.

Table 6 analysis of Suspect firms

	SPE				SPEC				SEAF				HDF			
	AEM		REM		AEM		REM		AEM		REM		AEM		REM	
	Coef	T	Coef	t	Coef	t	Coef	t	Coef	t	Coef	t	Coef	t	Coef	t
AEM/REM	-.321***	-12.71	-.455***	-12.71	-.164*	-1.77	-.191*	-1.77	-.149**	-2.01	-.194**	-2.01	-.135*	-1.77	-.820*	-1.77
Big4	-.015**	-2.21	-.009	-1.15	-.073**	-1.95	-.026	-0.64	.005	0.43	-.010	-0.72	-.048**	-1.78	-.190	-1.26
ROA	-.024	-0.96	-.111***	-3.70	-.059	-0.28	-.28	-1.25	-.013	-0.35	-.020	-0.45	-.991	-0.60	.278	0.69
Size	.001	0.14	.006	1.16	-.039*	-1.62	-.033*	-1.30	-.002	-0.26	-.003	-0.32	-.034	-0.73	-.087	-0.75
Growth	.010	1.09	.006	0.57	.015	0.31	.036	0.69	.001	0.01	.006	0.36	.016	0.27	.061	0.41
Type	.0086	0.58	.073**	2.50	-.002	-.24	-.021**	-2.48	.002	0.67	.001	0.77	.0016	1.30	.0027*	1.77
Leve	.072**	2.08	-.038	-0.94	-.130*	-1.72	-.108	-1.30	.029	1.31	.015	0.60	-.163*	-1.14	.194	0.54
BEF	-.019**	-2.44	.029***	3.23	-.129***	-2.72	.164***	3.24	-.020**	-1.88	.004	0.33	-.123**	-2.20	.221*	1.52
ACEF	-.019**	-3.05	.014**	1.94	-.149***	-4.80	-.035	-0.94	-.025	-2.14	.026*	1.93	-.191***	-2.82	.182	0.97
INSOW	.033*	1.61	-.051**	-2.12	.069	0.79	-.44***	-5.33	-.023	-0.55	-.179***	-3.85	.033	0.22	-.103***	-3.36
AC-FL	.470	0.75	.001	0.90	.001***	4.75	-.001**	-2.50	.001*	1.78	-.001**	-2.08	.001***	2.89	.003**	2.59

Table 6 reports the findings of the Suspect firms' analysis to examine the relationship between AEM and REM. All variables are defined as in Table 2

* Significance at the 0.10 level, ** Significance at the 0.05 level, *** Significance at the 0.01 level.

5.2 Robustness test

To check for more robustness of our results, we conduct a series of alternative tests. Firstly, an alternative measure of discretionary accruals is used to test whether the primary findings are robust to various measures or not. First, estimated AEM and REM using different measures. We measure AEM using Kothari et al.'s (2005) model. We estimated REM through combining abnormal CFO and abnormal PROD only. Doukakis (2014), argues that excluding the abnormal DISX variable has the advantage of making clear the net impact on abnormal cash flows from operations.

Secondly, following prior research (e.g. Zang, 2012; Choi et al. 2013), we control for endogeneity to check for robustness of our results. Previous studies (e.g. Ipino and Parbonetti, 2017; Sellami, 2016) suggest that both AEM and REM are affected by managerial decisions. Since the managers are likely to influence both AEM and REM, the relationship between them may be affected by an endogeneity problem (Zang, 2012). If AEM and REM are simultaneously determined by management's overall policies, the findings presented in table 5 could be biased and inefficient. Previous literature has pointed out several methods to control the endogeneity problem. The common method used in prior studies is the instrumental variables (IV) (e.g. Bound et al., 1995; Gujarati, 2008; McKnight and Weir 2009; Choi et al. 2013). In this context, the Hausman test has been used to check whether bias for the independent variables and endogeneity exists. The findings of Hausman test for the lagged value of AEM and REM ($R^2 = 0.0965$; $P = 0.01$, $R^2 = 0.127$; $P = 0.01$ respectively) confirm that the dependent variable and its interaction variables in the two regression models are endogenous and that the two-stage least squares approach should be adopted in the endogeneity analysis. The two main regression models reported in table 5 are repeated by employing the two-stage least squares method. The results of these robustness tests provide evidence that the findings of this study are robust and unchanged with different alternative measures (see table 7 & 8). Although some coefficients values were lower and showed a lower level of significance, the direction of the relationship between AEM and REM and the corporate governance mechanism and accruals flexibility remain the same.

Table 7: Results of panel regression of the alternative test

	REM (1)			AEM (2)		
	Coef	T	P> t	Coef	t	P> t
AEM/REM	-.188***	-12.51	0.001	-.718***	-13.34	0.001
Big4	-1.60***	-21.33	0.001	2.68***	13.75	0.001
ROA	-.087***	-4.99	0.001	-.036	-0.86	0.460
Size	-.035***	-6.18	0.001	-.057***	-4.14	0.001
Growth	.009	1.91	0.560	.008	0.70	0.143
Type	.003	0.41	0.681	-.002	-0.12	0.914
LEV	-.003	-0.31	0.767	.007	0.30	0.565
BEF	-.008*	-1.87	0.057	-.022**	-2.20	0.040
ACEF	-.006*	-1.73	0.065	.001	0.17	0.335
INSOW	.048**	2.03	0.011	-.236***	-4.08	0.001
AC-FL	.001***	3.50	0.001	-.001	-1.06	0.221

Table 7 reports the findings of the alternative analysis examining the relationship between AEM and REM. REM = combined proxy of real activities earnings management measured through employing Doukakis model (2014). AEM = Discretionary accruals measured through employing Kothari model as a mean proxy of AEM. All other variables are defined as in Table 2. * Significance at the 0.10 level, ** Significance at the 0.05 level, *** Significance at the 0.01 level

Table 8 Instrumental variables two-stage (IV 2SLS) model

	REM (1)			AEM (2)		
	Coef	Z	P> t	Coef	Z	P> t
Lagged AEM/REM	-1.33***	-11.38	0.001	-1.24***	-9.35	0.001
Big4	.0156	-1.59	0.161	-.017*	-1.76	0.065
ROA	-.079**	-2.27	0.018	-.190***	-4.91	0.001
Size	.003	0.47	0.632	-.0167***	-2.50	0.010
Growth	-.017	-1.35	0.181	-.0012*	-.10	0.093
Type	.013	0.89	0.848	.001	0.04	0.316
Lev	-.014	0.78	0.431	-.010	-.53	0.609
INSOW	-.036	-1.25	0.218	-.041	-1.37	0.410
BEF	.0177**	3.01	0.047	-.013	-1.56	0.112
ACEF	.018**	2.14	0.041	-.018**	-2.14	0.030
AC-FL	-.002***	-3.02	0.003	.0002***	3.52	0.001

Table 7 reports the findings of the analysis examining the Endogeneity problem between AEM and REM. * Significance at the 0.10 level, ** Significance at the 0.05 level, *** Significance at the 0.01 level.

6. Conclusion

This study examines the interaction between AEM and REM based on the constraints related to AEM in the case of Indian listed companies. Prior literature has investigated the trade-off decision made by management between AEM and REM based on the costs and constraints of each EM strategy. However, our study extends the existing literature by documenting a set of new variables (i.e. BEEF and ACEF) that explain the costs of AEM. Our results provide evidence that REM and AEM are substitutes for one another based on the relative constraints of AEM strategy, we find evidence consistent with increased use of REM when AEM is constrained. More specifically. Our results suggest that when AEM is constrained by BEEF, ACEE, Big4 and less accounting flexibility, managers are more likely to resort to REM. This study provides insights for practitioners, policy makers and academics. Firstly, practitioners may understand the function and importance of corporate governance roles in constraining EM and improving financial reporting quality. Managers may refer to this result when they purpose to persuade investors on financial reporting quality. Secondly, our study has policy implications for standard setters and regulators to continue improving the guidance and framework to assist firms to provide high-quality financial reporting.

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