

## Sentiment and Accruals Earnings Management: Does Governance and Regulatory Environment Matter?

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### ABSTRACT

This paper examines the implications of firm-level governance mechanisms and the regulatory environment on the relationship between investor sentiment and accrual-based earnings management. Our findings confirm the positive impact of sentiment on earnings management through accruals. Our results confirm that in the presence of a stringent regulatory environment, the likelihood of abnormal accruals following a positive sentiment environment is low. We document that a stringent regulatory environment reduces the likelihood of abnormal accruals following a positive sentiment environment. Results further confirm that improved governance characteristics like larger board, increased board independence, and stringent related party transaction norms help to monitor corporate behaviour and mitigates opportunistic earnings management activity of managers with an exogeneous effect of market sentiment. Thus, our results have important implications for regulators and policymakers for strengthening the regulatory and monitoring environment. Investors may also use earnings announcement news during an optimistic market sentiment scenario in a more informative way.

### KEYWORDS

Accruals, Earnings Management, Emerging Market, Investor Sentiment, Managerial Optimism

### INTRODUCTION

The use of discretionary or abnormal accruals in tests of earnings management and its associated managerial motives is widespread in the accounting and finance literature (Dechow et al., 1995; Kothari et al., 2005). Earnings management shows a corporate practice that is a deterrent to value relevance of accounting information (Marquardt and Wiedman, 2004). Existing literature has documented several firm specific and institutional determinants of earning management (Burgstahler and Dichev, 1997; Cheng and Warfield, 2005; Degeorge et al., 1999; García-Meca and Sánchez-Ballesta, 2009; Shen and Chih, 2007). However, limited attention has been paid to examine the impact of investor sentiment on accrual-based earnings management (AEM, hereafter). There is also negligible empirical evidence on the governance and regulatory environment moderating role for such relationships. This paper examines two complementary research questions related to sentiment and abnormal accrual relationships. First, whether the prevailing sentiment environment influences managers' strategic use of abnormal accruals. Second, whether the corporate governance and regulatory environment help to moderate the effect of sentiment on AEM.

There is increasing focus on the prevailing sentiment effect on the corporate managers' decision making and financial reporting (Ali and Gurun, 2009; Bergman and Roychowdhury, 2008; Brown et al.,

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2012; Hurwitz, 2018; Mian and Sankaraguruswamy, 2012; Miranda et al., 2018; Santana et al., 2020; Seybert and Yang, 2012; Simpson, 2013). Related literature suggests that managers try to cater to an optimistic sentiment environment in the market (Rajgopal et al., 2007) by increasing the management earnings forecast (Hurwitz, 2018; Mian and Sankaraguruswamy (2012). Thus, there exists a positive relationship between management earnings disclosures decisions and the prevailing sentiment environment (Bergman and Roychowdhury, 2008; Brown et al., 2012). Due to limited attention bias (Hirshleifer and Teoh, 2003; Hirshleifer et al., 2011), investors fail to recognize such opportunistic earnings management activity (Ali and Gurun, 2009). Collectively, these arguments suggest that optimistic market-wide sentiment exerts a significantly positive (negative) influence on the upward (downward) earnings management through accruals (Rajgopal et al., 2007; Santana et al., 2020; Simpson, 2013). However, the potential impact of the governance and regulatory environment on the sentiment induced opportunistic earnings management motives of managers presents a striking puzzle. For instance, Simpson (2013) reports that in periods of high sentiment, managers' incentives to report positive abnormal accruals increases due to their motives to meet or beat analysts' forecasts. However, it is unclear whether the sentiment and AEM relationship documented by Simpson (2013) persist when we control for the firm-specific governance characteristics and the regulatory environment.

The institutional and regulatory environments distinctiveness of the EMs provides an ideal setting to revisit the sentiment and AEM relationship. The corporate governance and regulatory environment have important implications for firms listed in the EMs (Jackling and Johl, 2009; Sarkar et al., 2008; Sarkar and Sarkar, 2009). EMs, by design, lack the institutional or financial architecture supporting their capital base compared to more established markets (Boonlert-U-Thai et al., 2006; Enomoto et al., 2015; Shen and Chih, 2007). Existing literature suggests that better governance and regulatory environment by design should avert the managers' incentive to manage earnings (Aono and Guan, 2008; García-Meca and Sánchez-Ballesta, 2009; Cohen et al., 2008). In the context of the Indian corporate environment, one of the significant regulatory changes is the introduction of the Clause 49 of the Listing Agreement initiated by the Securities and Exchange Board of India (SEBI) in the year 2000-01, considered to be a milestone in the evolution of corporate governance practices in India (Chakrabarti et al., 2008). Primarily, Clause 49 focuses on the composition of the corporate board and its structure for restraining corporate behaviour that deteriorates investor confidence. Furthermore, the introduction of the Companies Act 2013, in India, is considered one of the most crucial reforms in the country's corporate law. The Companies Act, 2013, has been developed to enhance transparency, self-regulation with business-friendly corporate guidelines, improve corporate governance, and enrich accountability from the auditors. Stringent corporate governance norms in EMs like India are essential as this type of economy possibly has several unique governance issues not prevalent in more widely researched developed economies (Balasubramanian et al., 2010; Chakrabarti et al., 2008; Jackling and Johl, 2009; Narayanaswamy et al., 2012). Given the distinctive features of EMs regulatory and institutional environment, it is reasonable to argue that governance and regulatory reform's moderating effect are two critical channels that need to be examined in the context of sentiment and AEM relationship. Moreover, the magnitude of the sentiment effect varies from country to country (Baker et al., 2012; Schmeling, 2009) and investors' behavior in the EMs is noticeably different from the developed markets (Kim and Nofsinger, 2008). Furthermore, there is no available study which examines the implication of the market sentiment in the emerging market on the abnormal accruals.<sup>1</sup>

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<sup>1</sup> Santana et al. (2020) and Miranda et al. (2018) can be considered two exceptions in this regard as they provide some preliminary evidence of sentiment and AEM relationship from the Brazilian stock market. However, our study is distinct in terms of corporate governance and regulatory environment focus, use of performance matched AEM measures, a comprehensive set of control variables, macroeconomy and shareholding patterns controls, use of alternative sentiment measures, large sample evidence, and robustness tests.

We use the Dechow et al. (1995) and Kothari et al. (2005) approach for measuring four proxies of AEM for sample of non-financial listed companies in India during the period 2000-2017. We follow Baker and Wurgler (2006) for constructing sentiment index from six implicit market-related variables. Apart from standard firm-specific and macroeconomic control variables, we use five comprehensive corporate governance measures, i.e., the board size, board meeting, board independence, board attendance, and a corporate governance index. We also examine the effect of regulatory change due the Companies Act 2013 and regulatory quality on the sentiment and AEM relationship. We also examine the influence of earnings management shifting, global financial crisis, audit quality, analysts forecast estimates, and alternative sentiment proxies for the robustness of our results. Our findings confirm the positive impact of sentiment on earnings management through accruals. Our results are a consistent across a battery of robustness checks. Specifically, the income-increasing earnings management occurrence is positively associated with the sentiment. We also document in a stringent regulatory environment, the likelihood of abnormal accruals following a positive sentiment environment is low. Our results further confirm that improved governance characteristics like larger board, increased board independence, and stringent related party transaction norms help to monitor corporate behaviour and mitigates opportunistic earnings management activity of managers with an exogeneous market sentiment effect.

Our paper extends the related literature in the following aspects. Our paper examines the relationship between sentiment and AEM in the context of firm-level governance mechanism and the regulatory environment. In this regard, our findings complement Simpson (2013) by controlling the effects of firm-specific governance mechanism, institutional ownership, regulatory reform, and regulatory quality. Our results also help to shed insights on the related strand of literature (e.g., Ali and Gurun, 2009; Bergman and Roychowdhury, 2008; Brown et al., 2012; Hribar and McInnis, 2012; Rajgopal et al., 2007; Mian and Sankaraguruswamy, 2012; Simpson, 2013) which documents the role of investor sentiment on the financial reporting choices and earnings announcements. Our paper also expands the literature on behavioural finance and the role of investor sentiment for accounting disclosure. Second, our findings contribute to the EMs literature regarding the implication of a market-wide sentiment environment to influence financial reporting choices. Our study extends the EMs literature by investigating the relationship between market-wide sentiment and strategic use of positive and negative abnormal accruals. Fourth, our study also extends the EM literature by examining whether firm-level corporate governance moderates the impact of market-wide sentiment on abnormal accruals.

The remainder of this paper is organized as follows. Section 2 presents our hypothesis. Section 3 describes the data and variables. Section 4 discusses our empirical approach. Section 5 presents our results. Section 6 concludes the paper.

## **RELATED LITERATURE AND HYPOTHESIS DEVELOPMENT**

There has been an increased focus on the impact of sentiment on the managerial motives and corporate reporting practices. Existing literature provides compelling arguments that highlight the fact that managerial motives for managing earnings could be related to the catering hypothesis of earnings management and limited attention bias of investors. Early study by Rajgopal et al. (2007) documents that managers try to cater the prevailing investor demand for earnings surprises by increasing abnormal accruals. Such catering behaviour of managers are related to four incentives, i.e., stock price concerns related to negative earnings surprise, matching the past performance, to maintain repute with the stakeholders, and to either beat or meet the analysts' forecasts (Burgstahler and Dichev, 1997; Degeorge et al., 1999). Consistent with arguments, Hurwitz (2018) find that

management earnings forecast optimism increases with optimistic sentiment environment. Therefore, managers are more likely to use opportunistic pro forma disclosure to make the firm's financial performance more appealing to investors when sentiment-driven mispricing is high (Bergman and Roychowdhury, 2008; Brown et al., 2012). Since the market-wide sentiment influences the stock price sensitivity to firm-specific earnings news (Mian and Sankaraguruswamy, 2012), the general sentiment driven mispricing of stocks is expected to be higher during optimistic environment. The overvaluation in the market incentivises managers' strategic use of abnormal accruals to overstate earnings and to report optimistic earnings numbers during periods of high investor sentiment (Simpson, 2013). Behavioural finance literature suggests that investors are susceptible to such opportunistic managerial motives for earnings management due to the limited attention bias (Hirshleifer and Teoh, 2003; Hirshleifer et al., 2011). It has been well documented that investor attention is a scarce cognitive resource (Tversky and Kahneman, 1973), and thus, investors behaviour for attention apportionment to accounting information is very selective (Hirshleifer et al., 2011; Peng and Xiong, 2006). Therefore, investors' behavioral biases affect how accounting information is impounded into stock prices (Hirshleifer and Teoh, 2003; Hirshleifer et al., 2011; Mian and Sankaraguruswamy, 2012). Managers exploit investors' greater overvaluation, and limited attention during high sentiment periods by reporting higher accruals (Ali and Gurun, 2009). Hence, aggregate sentiment driven mispricing encourages opportunistic proforma disclosure due to limited attention bias of investors. Therefore, it is reasonable to expect that the incentives for managers to choose opportunistic AEM rely on aggregate sentiment. The above discussion leads to our first hypothesis:

**H1a:** Managers' strategic use of abnormal accruals is influenced by market-wide sentiment environment.

The existing literature recommendation for a positive relationship between market-wide sentiment and abnormal accruals may not be uniform for the upward and downward earnings management. Since, optimistic (pessimistic) sentiment environment decreases (increases) investor risk aversion behavior (Bergman and Roychowdhury, 2008), the resultant effect of limited attention bias is also expected to be different during these two periods (Mian and Sankaraguruswamy, 2012). In other words, positive (negative) earnings announcement news during optimistic (pessimistic) sentiment periods has more inherent information content. Companies manage earnings upward to avoid reporting losses, earnings declines, or negative earnings surprises on their short-horizon disclosure choices (Burgstahler and Dichev, 1997; Degeorge et al., 1999; Filip and Raffournier, 2014). During low-sentiment periods, managers increase the frequency of long-horizon earnings forecasts to adjust market expectations of future earnings upwards to correct a pessimistic bias in analyst earnings estimates (Bergman and Roychowdhury, 2008). Therefore, sentiment environment will positively (negatively) affect the managerial motives to use opportunistic pro forma disclosure with higher (lower) abnormal accruals. The above discussion leads us to hypothesize that:

**H1b:** The income-increasing (income-decreasing) earnings management through accruals will have positive (negative) association with prevailing market-wide sentiment environment.

Existing literature supports the fact that the firm-level corporate governance mechanism helps to ensure the application of specific guidelines and principles by which corporate managers should be held accountable to stakeholders (Brown et al., 2011; Chakrabarti et al., 2008; Shen and Chih, 2007). The corporate governance literature documents the importance of corporate board for the agency cost, corporate performance, earnings management, and reporting quality (Ahmed et al., 2006; Arora and Sharma, 2016; González and García-Meca, 2014; Jackling and Johl, 2009; Sarkar and Sarkar, 2009;

Xie et al., 2003). The board of directors plays a crucial role in the firm's strategic decision-making processes, information asymmetry minimization (Hermalin and Weisbach, 1998), including earnings quality monitoring aspect (Sarkar et al., 2008; Shaw et al., 2016; Singh and Gaur, 2009). This helps the board to mitigate agency conflicts and to improve the contracting efficiency (Ball and Shivakumar 2005; García Lara et al., 2009). Moreover, a larger board allows for specialization within the board because of better allocation of duties and expertise, which further improves the board's monitoring ability (Ahmed and Duellman, 2007; Ahmed and Henry, 2012; Lim, 2011). The board's monitoring intensity also increases with an increase in the proportion of independent directors (Hermalin and Weisbach, 1998). Higher number of board meetings reduce management's rent-seeking and opportunistic behavior and increase the board's monitoring ability (Jackling and Johl, 2009; García Lara et al., 2009; Lipton and Lorsch, 1992). Since governance characteristics like board size, board independence, board attendance, and board meeting help monitor corporate behavior, we postulate that better governance mechanisms will moderate the effect of sentiment on managers' opportunistic behavior for earnings management. Based on the above discussion, we put forward our hypothesis as follows:

**H2a:** Better corporate board level governance mechanism will moderate the effect of market-wide investor sentiment on earnings management.

Another essential element that influences better monitoring of managerial actions is related to the regulatory environment (Enomoto et al., 2015; Leuz et al., 2003). Existing literature suggests that apart from firm-level determinants, institutional and regulatory factors affect earnings management and reporting quality (Enomoto et al., 2015; La Porta et al., 2000; Leuz et al., 2003). Earnings management is expected to decrease in countries with more robust investor protection (Boonlert-U-Thai et al., 2006; Enomoto et al., 2015). A robust regulatory environment with prudent investor protection measures limits insiders' ability to acquire private control benefits, which reduces their incentives to mask firm performance from outsiders (Leuz et al., 2003). Given the fact that regulatory reform aims at curbing management's self-serving behavior that is detrimental to other stakeholders (Aono and Guan, 2008; Bartov and Cohen, 2007; Cohen et al., 2008), it is prudent to reason that the regulatory environment should also help to minimize the effect of prevailing market-wide sentiment on earnings management. Based on the above discussion, we propose our next hypothesis as follows:

**H2b:** Stringent regulatory environment hinders earnings management through accruals following a positive market-wide sentiment environment.

## DATA AND VARIABLES

Our sample consists of actively traded non-financial firms listed on the Bombay Stock Exchange (BSE)<sup>2</sup> of India during the period 2000-2017. The sample period selection is constrained upon the consistent availability of data for the sentiment index construction. Relevant data are extracted from the Centre for Monitoring Indian Economy (CMIE) PROWESS database. We use 9669 observations in total after filtering for firms that have consistent total assets information and excluding financial firms.

## ACCRUAL EARNINGS MANAGEMENT (AEM) VARIABLES

Consistent with Dechow et al. (1995) and Kothari et al. (2005), we use a cross-sectional model to

<sup>2</sup> Established in 1875, the BSE is considered the world's 10th largest stock exchange with a market capitalization exceeding \$ 2.3 trillion as per the World Federation of Exchanges report (2018).

calculate discretionary accruals for each year and each industry with a minimum of ten observations. The total accrual (TACC) at time  $t$  is calculated by the difference between earnings and operating cash flow (CFO).

$$TACC_t = Earnings_t - CFO_t \quad (1)$$

Where  $Earnings_t$  is the income before extraordinary items and taxes.  $CFO_t$  is cash flow from operating activities. We calculate the normal level of total accruals by following the modified Jones (Dechow et al., 1995) model. The difference between the total accruals calculated using equation (2), and the normal level of total accruals (TACC) is the discretionary accruals ( $ABAC_{MJ}$ ).

$$\frac{TACC_t}{TA_{t-1}} = \beta_1 \left( \frac{1}{TA_{t-1}} \right) + \beta_2 \left( \frac{\Delta S_t - \Delta AR_t}{TA_{t-1}} \right) + \beta_3 \left( \frac{PPE_t}{TA_{t-1}} \right) + \epsilon_t \quad (2)$$

In the equation (2), total accruals ( $TACC_t$ ) scaled by lagged total assets is the dependent variable which is explained by the difference in change in sales of the firm ( $\Delta S_t$ ) and change in accounts receivables ( $\Delta AR_t$ ) as well as gross property, plant and equipment ( $PPE_t$ ) at time  $t$  (all scaled by lagged total asset). The lagged total assets ( $TA_{t-1}$ ) is used to mitigate heteroscedasticity in the residuals. Furthermore, we follow Kothari et al. (2005) to calculate abnormal accruals by the performance matching method. We control for the effect of performance by adding it as an explanatory variable (to include  $ROA_{it}$  or  $ROA_{it-1}$ ) in the modified Jones model to establish the effectiveness of performance matching. The equation is:

$$\frac{TACC_t}{TA_{t-1}} = \beta_1 \left( \frac{1}{TA_{t-1}} \right) + \beta_2 \left( \frac{\Delta S_t - \Delta AR_t}{TA_{t-1}} \right) + \beta_3 \left( \frac{PPE_t}{TA_{t-1}} \right) + \beta_4 (ROA_{t \text{ or } t-1}) + \epsilon_t \quad (3)$$

The equation (3) augments the modified-Jones model with return on asset (ROA), and hence we prefer to name it as  $ABAC_{ROA}$  and  $ABAC_{LGROA}$  considering both the performance indicators, i.e.,  $ROA_{it}$  and  $ROA_{it-1}$ . Consistent with the Kothari et al. (2005) approach, we follow performance matching based on  $ROA_t$  wherein our aim is to compute the performance-matched discretionary accruals ( $ABAC_{PM}$ ), i.e., the difference between Jones-model discretionary accrual for firm  $i$  in year  $t$  and the matched firm's Jones-model discretionary accrual for year  $t$ . We use unsigned abnormal accruals of all the four proxies ( $ABAC_{MJ}$ ,  $ABAC_{ROA}$ ,  $ABAC_{LGROA}$ ,  $ABAC_{PM}$ ) to measure AEM for the full sample. Testing for earnings management by signed discretionary accruals (positive or negative) limits the power of tests and reduces the likelihood of rejecting the null of no earnings management (Hribar and Nichols, 2007). The signed or positive (negative) abnormal accruals will be our proxy for income-increasing (income-decreasing) AEM.

## SENTIMENT MEASURE

Behavioral finance literature defines investor sentiment as the collective error of investors arising from a combination of noise trading and irrational cognitive biases that cannot be justified with fundamental facts at hand (Baker and Wurgler, 2006; Brown and Cliff, 2004; Schmeling, 2009). Furthermore, behavioral finance literature suggests that there is no perfect measure of investor sentiment (Baker and Wurgler, 2006; Brown and Cliff, 2004; Brown et al., 2012; Schmeling, 2009). As Zhou (2018, p.241) cogently puts it "investor sentiment is inherently measured with errors, even though there is assumed to be a true investor sentiment. In fact, the true investor sentiment is almost always unobservable, and all computed measures are proxies". Zhou (2018) suggests that the use of

alternative sentiment measures in the empirical behavioural finance literature can be summarised under three broad categories. First, market-based measures (e.g., sentiment index constructed by Baker and Wurgler, 2006). Second, survey-based measure (e.g., consumer confidence index used by Schmeling, 2009). Third, text- and media-based measure constructed from various media and internet activities (e.g., Google search volume index operationalised by Chen, 2017).

Given the fact that there is no uncontroversial and universal proxy for measuring sentiment (Qiu and Welch, 2006; Zhou, 2018), we consider one of the widely used approaches in empirical literature, i.e. the Baker and Wurgler (2006) sentiment index constructed through several implicit market related sentiment proxies<sup>3</sup>. Consistent with the Baker and Wurgler (2006) and Brown and Cliff (2004) we use the first principal component of six monthly implicit market sentiment proxies such as: turnover (TR, i.e., ratio of the total traded value to the total stock market capitalization), number of initial public offering in a month (NIPO), advance-decline ratio (ADR, i.e., ratio of the number of advancing stocks to the number of declining stocks), cash to total assets ratio (CTA) of mutual fund companies, put-call-ratio of the index (PCR, i.e., ratio of number of index put options to call options), and Dividend premium (Divp, i.e., difference of the average market-to-book ratio of dividend-paying companies and average market-to-book ratio of dividend non-paying companies). Data for the sentiment proxies (except Divp) has been collected from several Indian regulatory institutions; National Stock Exchange (NSE) of India, Association of Mutual Funds in India (AMFI), and Securities and Exchange Board of India (SEBI), Reserve Bank of India (RBI) websites. The dividend payment and market-to-book ratio for Divp construction are collected from PROWESS database.

TR is a measure of positive market sentiment as higher overall turnover in the market indicates relative demand of investors arising from optimistic expectations (Baker and Wurgler, 2006). NIPO indicates optimistic market sentiment as investor sentiment grows, IPO offer size increases as firms try to time their IPO to coincide with periods of high valuations (Baker and Wurgler, 2006; Brown and Cliff, 2004; Ljungqvist et al., 2006). ADR is a technical indicator associated with market optimism as it compares the level of securities rising in price relative to the level of those falling in value (Brown and Cliff, 2004). CTA is an implicit pessimistic sentiment proxy derived from the mutual fund managers market activities and to a larger extent highlights institutional investor sentiment. Presumably, a fund's cash holdings will be negatively related to its optimism about the market and therefore higher values of CTA indicates pessimistic market perception of fund managers (Brown and Cliff, 2004). PCR is a negative sentiment indicator as it suggests that investors are preferring more put options than to call options, thus bearish sentiment is building in the market (Brown and Cliff, 2004). DivP suggests relative demand for safe-haven assets or dividend paying stocks as compared to dividend non-paying stocks and essentially means flight to quality and safety behaviour of the investors anticipating a market downturn. Taken all together our set of implicit sentiment proxies represent secondary market trading behaviour (TV, ADR), primary market activity (NIPO), mutual fund market (CTA), derivative market (PCR), and relative demand of investment asset class (DivP). Considering their theoretical sign, i.e., optimistic, or pessimistic characteristics, the monthly (m) aggregate investor sentiment (ISent) for the market can be described as:

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<sup>3</sup> In our robustness tests we also examine the implications of investor sentiment for AEM through alternative sentiment measures like consumer confidence (survey-based measure, Schmeling, 2009) and Google search volume intensity (Chen, 2017). Similar argument for robustness test with alternative sentiment measures also highlighted by related strand of literature in accounting and finance (Bergman and Roychowdhury, 2008; Brown et al., 2012; Simpson, 2013). For instance, Simpson (2013) study uses Michigan Consumer Sentiment Index (MCSI) as main sentiment proxy and other measures like share turnover, level of margin borrowing, bull-bear spread as alternative proxies for market-wide sentiment. Bergman and Roychowdhury (2008) also use MCSI. Brown et al. (2012) use market-based sentiment index proposed by Baker and Wurgler (2006). Rajgopal et al. (2007) use average MCSI, closed-end fund discount, share turnover, and the equity share in new issues as proxies for investor optimism. However, our main results and discussion will focus on the Baker and Wurgler (2006) sentiment index as a proxy for market-wide investor sentiment component.

$$ISent_m = (TR_m) + (NIPO_m) + (ADR_m) - (CTA_m) - (PCR_m) - (Divp_m) \quad (4)$$

There are two important aspects that need to be addressed before we resume our final sentiment index construction. First, orthogonalization of sentiment variables to capture the irrational component. The raw sentiment proxies in equation (3) cannot be directly operationalized to create our sentiment index. This is because, when an investor is optimistic (e.g., TR or ADR) or pessimistic (e.g., PCR or Divp) as suggested by these variables, could be because of rational expectation or irrational enthusiasm or a combination of both (Baker and Wurgler, 2006; Brown and Cliff, 2004). Therefore, it is likely that each sentiment proxy may include an irrational sentiment component as well as rational component. From an objective point of view, the sentiment index should reflect the irrational component. Consistent with Baker and Wurgler (2006), we orthogonalize raw sentiment proxies by regressing them with four fundamental factors, i.e., call money rate, term spread, change in the index of industrial production, and inflation rate. The fitted values of such regression will capture the rational component of sentiment proxies, and the residuals from these regressions will be a proxy for the irrational sentiment component. The residuals or orthogonalized sentiment measures then operationalized for the index construction.

Second, we must account for the relative timing of these orthogonal sentiment variables in the final index construction. In other words, some of the sentiment measures may exhibit lead-lag relationships with the aggregate market wide sentiment and some variables may reflect a shift in sentiment earlier than others (Baker and Wurgler, 2006). Sentiment proxies that involve firm supply responses (e.g., NIPO, CTA) can be expected to lag behind proxies that are based directly on investor demand (e.g., TR, ADR). The lead-lag relationship between the orthogonal implicit proxies and aggregate investor sentiment is addressed through the dual index construction approach of Baker and Wurgler (2006). In the dual index construction approach, using principal component analysis we create a first-stage index with 12 loadings (one for each of the current and lagged proxies). We then calculate the correlation between the first-stage index and the current and lagged values of each of the orthogonal sentiment proxies. Finally, we select each respective proxy's lead or lag, whichever has higher correlation with the first-stage index (e.g.,  $NIPO_m$ ,  $TR_{m-1}$ ,  $ADR_{m-1}$ ,  $CTA_m$ ,  $PCR_{m-1}$ ,  $Divp_m$ ). Except for Divp, consistent with Baker and Wurgler (2006) we find that most of the investor demand response variables influence the current sentiment ( $m$ ) with a lag. Finally, we define our monthly sentiment index ( $ISent_m$ ) constructed from the weights derived through the second principal component analysis (explains 45 per cent of the sample variance) of six selected variables with following specification:

$$ISent_m = (0.52 * TR_{m-1}) + (0.51 * NIPO_m) + (0.12 * ADR_{m-1}) - (0.30 * CTA_m) - (0.60 * PCR_{m-1}) - (0.05 * Divp_m) \quad (5)$$

As our AEM variables are in the yearly frequency, we convert our monthly sentiment index into an annual sentiment index ( $Sent$ ). Our final yearly ( $t$ ) market-wide sentiment index ( $Sent_t$ ) is the weighted average of the monthly sentiment index ( $ISent_m$ ). We assign weights as per the proximity of the month with the financial year end (March) in the sample year  $t$ .<sup>4</sup> Existing literature (Arif and Lee, 2014; Bergman and Roychowdhury, 2008; Brown et al., 2012; Rajgopal et al., 2007; Simpson, 2013) which constructs lower frequency (quarterly or annual) sentiment index, does not explicitly mention their approach (e.g., arithmetic average, geometric average, or weighted average) for converting their sentiment index from higher frequency to lower frequency. Our approach for selecting the weighted average method is motivated by the empirical evidence of sentiment risk pricing in the market and

<sup>4</sup> However, we use an alternative sentiment index (ASent) using a simple average-based annual sentiment index construction approach for our robustness tests (Section 3.2.1). However, we find no significant difference in our results.



relative timing for the AEM. For instance, managers typically engage in AEM toward the end of an accounting period, after most real operating activities are completed (Dechow et al., 1995; Kim et al., 2013; Kothari et al., 2005). Therefore, AEM provides more opportunities for managers to time the earnings surprise for market participants (Ali and Gurun, 2009; Brown et al., 2012; Seybert and Yang, 2012). Since investor sentiment is strongly correlated with contemporaneous market returns (Baker and Wurgler, 2006; Brown and Cliff, 2004; Schmeling, 2009), managerial motives for opportunistic AEM will depend more on the near-term market sentiment as the accounting year will be close to its end. Therefore, we prefer to construct our annual sentiment index with more weights assigned to the near-term market sentiment (i.e.,  $m$ ) compared to the beginning of the year market sentiment level (i.e.,  $m_{-12}$ ).

## ALTERNATIVE SENTIMENT PROXIES

First, we construct an alternative sentiment index ( $ASent$ ) following the similar approach discussed in Section 3.2 with an inclusion of additional sentiment proxy, i.e., first day IPO return (RIPO). Clarke et al. (2016) using sample of Indian IPO listed companies suggest that first day IPO returns are driven by the unmet demand of retail investors and such returns support the sentiment-based models of IPO initial returns. Early study by Dorn (2009) also supports the notion that sentiment drives retail trading decisions and therefore, IPOs that are aggressively bought by individuals exhibit high first-day returns. Although our initial sentiment index includes NIPO as one of the primary market activity variables it fails to accommodate the investor demand response in the IPO market. Baker and Wurgler (2006) highlight that perhaps sentiment is partly behind the high first-day IPO returns (investor demand responses), and this attracts additional IPO volume with a lag (firm supply responses). Therefore, we construct an alternate sentiment index<sup>5</sup> with three innovations, i.e., inclusion of RIPO as additional sentiment variable, inclusion of FII inflow as additional orthogonal variable, and annual index construction with simple average approach. In principle the FII inflow expected to support economic growth by providing external lower cost of capital to supplement productive investments, enhance market liquidity, risk diversification (Vardhan and Sinha, 2016). However, in the context of Indian capital market empirical evidence suggest that FII inflow, and sometimes sudden reversal of its inflows bring excess volatility, herding, and financial instability in the market (Choudhary et al., 2022; Garg and Mitra, 2015; Lakshman et al., 2013). Since Indian markets are more sensitive to the behaviour of foreign institutional investors (FII)<sup>6</sup>, we have also used percent change in net FII inflow as additional fundamental factor in the orthogonal process. Our alternate monthly sentiment index ( $ASent_m$ ) after inclusion of IPO first-day return (RIPO) and FII inflow as orthogonal variable can be specified as:

$$ASent_m = (0.05 * RIPO_m - 1) + (0.15 * TR_{m-1}) + (0.62 * NIPO_m) + (0.49 * ADR_{m-1}) - (0.37 * CTA_m) - (0.18 * PCR_{m-1}) - (0.41 * Divp_m) \quad (6)$$

Our alternative monthly sentiment index ( $ASent$ ) measure is based on the common variation in seven underlying proxies for sentiment. The index weights are derived from the second PCA having 43% of sample variance. Our alternative annual sentiment ( $ASent$ ) operationalised in the robustness test of Table 4 (Panel A) has been constructed through the simple average method. We observe a 0.66 (p value = 0.05) positive correlation between  $ISent$  and  $ASent$ . Therefore, both the index resemble similar market sentiment measure with alternative specifications.

<sup>5</sup> We are thankful to the reviewer for guiding us in this direction.

<sup>6</sup> In the context of India, the regulatory policy framework for FIIs in the form of foreign portfolio investments (FPIs) follow are governed by the guidelines issued by the central bank of India (RBI) and Security Exchange Board of India (SEBI).

Second, consistent with Habib and Hasan (2017) we use the dummy variable (*Sent\_Dummy*) approach, i.e., an indicator variable coded one for high sentiment period and zero otherwise. Third, we collect business confidence index data from the OECD data library to measure alternative sentiment proxy following Schmeling's (2009) approach<sup>7</sup>. Forth, Consistent with Chen's (2017) approach, to measure investor attention (IA), we use Google search volume index (GSVI) for the keyword search of the Indian stock market like "BSE Sensex".

## REGULATORY ENVIRONMENT VARIABLES

We consider the introduction of the Companies Act, 2013 as one of the major regulatory changes in the Indian corporate environment.<sup>8</sup> In order to capture the effect of the regulatory environment we have created a dummy variable (*DCompAct<sub>t</sub>*) which takes a value one for the period 2013-17 (post regulation reform) and zero otherwise (2000-12).

The inclusion of Companies Act dummy variable (*DCompAct*) may be able to capture the implications of the regulatory changes at a macro-level but will not answer the micro-level effects that may arise from company level compliance (e.g., Sub-section 3 and 5 of Section 149). To examine the effect of specific provisions of Companies Act (2013) we have also created additional three measures pertinent to important sections and sub-sections of the Companies Act<sup>9</sup>. For instance, the Companies Act, 2013 (Section 149) states minimum and maximum number of the board of directors in a company. The maximum number of recommended directors in a public company is 15 (minimum number is 3). As per the provision of the Act, the company can raise the number of directors beyond 15, by passing a special resolution in the general meeting. Moreover, Section 149 (4) of the act suggests that every listed public company shall have at least one-third of the total number of directors as independent directors. Section 149 (3 and 5) of the Act further recommends that every company existing on or before the date of commencement of this Act shall within one year from such commencement comply with the requirements of the provisions of sub-section. Another important aspect of the Companies Act (2013) is its strict provisions pertinent to related party transactions (RPT). RPTs may reduce firms' valuable resources that may lead to significant reduction in future firm operating performance (Chauhan et al. 2016; Islam, 2020). Section 188 of the Act mentions that except with the consent of the board of directors given by a resolution at a meeting of the board and subject to such conditions as may be prescribed, no company shall enter into any contract or arrangement with a related party. Nevertheless, RPT can have stringent implications for the appointment of director if he has been convicted of the offence dealing with RPT at any time during the last preceding five years (Section 164).<sup>10</sup>

<sup>7</sup> We have not included the consumer confidence index (CCI) measure of investor sentiment as discussed in Schmeling (2009), because the CCI data for India is only available since 2011 through the Reserve Bank of India. The BCI provides information on future developments, based upon opinion surveys in the industry sector. Like CCI, it can be used to monitor output growth and to anticipate turning points in economic activity. Details can be accessed through <https://data.oecd.org/leadind/business-confidence-index-bci.htm>.

<sup>8</sup> As per the notification of the Ministry of Corporate Affairs (MCA) Government of India the Companies Act, 2013 is notified as an Act to consolidate and amend the law relating to companies. MCA has initiated the process to implement the 2013 Act in consultation with concerned regulatory authorities, Ministry of Law and Justice, and other stakeholders. The Companies Act, 2013 (2013 Act) was asserted by the honourable President of India on 29 August 2013 and published in the Official Gazette on 30 August 2013. This is considered as one of the most important reforms in the country's corporate law with modern legislation, which includes several relevant provisions that modernize India's corporate governance rules. It enables greater regulation of the corporate sector in India. This was the first major reform after the Companies Act, 1956 was incorporated.

<sup>9</sup> We are thankful to the reviewer for guiding us in this direction.

<sup>10</sup> To improve transparency related to RPTs, in India, RPT regulations are drafted in the Companies Act (2013), Clause 49 of the Listing Agreement (SEBI), and Indian Accounting Standard (Ind AS 24). As per Clause 49 the audit committee to approve all RPTs and requires the firm to disclose "materially significant" RPTs to shareholders. See for e.g., Chauhan et al. (2016), Balasubramanian et al. (2010), and Islam (2020) for more discussion on RPT in the context of Indian regulatory environment.

In order to capture the effect of board size, independent directors, and RPT we follow a dummy variable approach. In our empirical design we split our sample period into two sub-periods, i.e., before companies Act (2000-2012) implementation and after companies Act (2013-2017) implementation. Furthermore, we create dummy variable for classifying firms into two groups within each sub-sample. First, we coded firms as 1 if they increase board size and zero if they do not change or decrease the board size (*DB\_Size*). Second, in order to capture the effect of provisions related to independent directors we create a dummy variable classifying firms into 2 groups. We coded firms as 1 if they show increase in proportion of independent directors and zero if they do not change or decrease the proportion of independent directors before and after the enactment of the Act (*DB\_Ind*). Third, we create a dummy variable assigning value of 1 to the firms who do RPT and zero to the firms who do not indulge into RPT based on their annual report disclosure (*DPRT*).

Additionally in our robustness test, we use two proxies to capture effect of regulatory environment, i.e., country regulatory quality and global financial crisis. To capture that country-specific governance and institutional environment, we also consider the Regulatory Quality (RQ) measure for India from the World Bank Worldwide Governance Indicators<sup>11</sup>. Regulatory quality captures perceptions of the ability of the government to put together and execute rigorous policies and regulations that permit and promote private sector development (Kaufmann et al., 2011). To examine the influence of the 2008–2009 global financial crisis (GFC) on the AEM practices of Indian listed firms, we use a crisis dummy variable (*GFCDummy*, i.e., value one after the crisis period and zeros otherwise).

## BOARD LEVEL GOVERNANCE VARIABLES

Consistent with the related literature (Ball and Shivakumar 2005; Jackling and Johl, 2009; García Lara et al., 2009; Sarkar et al., 2008; Shaw et al., 2016) we use firm-level board characteristic variables to measure corporate governance. To examine whether the board plays any moderating role in the relationship between sentiment and AEM we consider industry-year median adjusted values of four board characteristics, i.e., board size, board independence, board meeting frequency, and attendance of the board members. We define board size (*CG1\_Bsize*) as natural log of number of directors in the board. Board independence (*CG2\_Bindip*) is defined as percentage of independent directors in the board.

We use two proxies related to board meetings, i.e., we consider log of total meetings conducted by the firms (*CG3\_Bmeet*), and second, we look at the average attendance of the board members (*CG4\_BAttend*). We also construct a composite corporate governance index (*CG5\_CGIndex*) from four board characteristics; *CG1\_Bsize*, *CG2\_Bindip*, *CG3\_Bmeet*, and *CG4\_BAttend*. The use of a composite governance index has an advantage in that the measure does not rely on a single dimension of the board, but on multiple dimensions of the board. Following Hawas and Tse (2016), we first determine the industry-year median for board size, board independence, board attendance, and other directorships to capture the varying effect of industry and year on the effectiveness of governance (Donker and Zahir, 2008). Second, we code board characteristics variables as 1 if the value pertaining to a firm each year is higher than the industry-year median, and 0 otherwise. Finally, we construct the governance index, *CG5\_CGIndex*, as the sum of the four binary variables constructed in the previous step. Thus, *CG5\_CGIndex* takes the value between 0 to 4, and the higher the value of *CG5\_CGIndex*, the stronger the firm's governance in the industry for the given year.

Consistent with Lin and Hwang (2010), Becker et al. (1998), and Commerford et al. (2016) argument, we include audit quality as an additional robustness test for analyzing the effect of accounting reporting quality. We measure the audit quality as a dichotomous variable whether the firm has been

<sup>11</sup> Details of the database can be accessed from <https://info.worldbank.org/governance/wgi/Home/Documents>.

audited by the Big four (Big4) auditors and assume that Big Four (Big4) auditors are of higher quality than non-Big Four auditors.

## CONTROL VARIABLES

The selected control variables can be broadly categorized as firm-specific and macro-economic. Consistent with related literature (Anagnostopoulou and Tsekrekos, 2017; Bhattacharya, 2001; Lee et al., 2006; Skinner and Sloan, 2002; Simpson, 2013) we control for firm size (*Size*) measured as the natural log of net sales<sup>12</sup>. The market-to-book ( $MB_t$ ) ratio of the firm *i* at the beginning of year *t*, used as a proxy for firms' growth opportunities. We control for the financial performance of the firm by including Return on Assets ( $ROA_t$ ) as our control variable. Firm age is measured as the difference between the year of calculation (*t*) and the year of the firm's incorporation ( $Age_t$ ). We also control for the systematic risk of the firm *i* in the year *t* using market beta ( $Beta_t$ ). The financial distress risk arising from high leverage ( $Lev_t$ ) is controlled by the debt-to-equity ratio.

We also control for ownership and governance variable since several studies provide evidence that corporate governance mechanisms can mitigate discretionary accruals (Chowdhury et al. 2018). We classify the ownership structure broadly into two categories, institutional ownership ( $I\_Own_t$ ) and promoter ownership ( $P\_Own_t$ ).<sup>13</sup> The ownership measures ( $I\_Own_t$  and  $P\_Own_t$ ) are measured in terms of the percentage of shareholding by institutional investors and promoters, respectively. In our empirical analysis, we also test whether a firm's decision to manage earnings is associated with investor sentiment (*Sent*) after controlling the effect of macroeconomic and regulatory quality variables. We include inflation growth rate ( $INF_{t-1}$ ), term-spread ( $TS_{t-1}$ ), and annual BSE Sensex return ( $MR_{t-1}$ ) for capturing the effect of lag macroeconomic conditions. Appendix 1 summarises variable descriptions.

Table 1 and Table 2 report the descriptive statistics and correlation matrix. For the entire sample period, we find pessimistic market-wide sentiment environment with a mean value of -0.02. Except for  $ABAC_{MJ}$ , we observe more persistence of income-decreasing abnormal accrual for  $ABAC_{ROA}$ ,  $ABAC_{LGROA}$ , and  $ABAC_{PM}$ . The Indian firms are majorly dominated by promoter shareholding ( $P\_Own$  mean = 54.72) as compared to institutional shareholding ( $I\_Own$  mean = 12.73). We note a positive relationship between *Sent* and all the four proxies of abnormal accruals. Considering observed correlations between several variables, we do the test for multicollinearity by computing VIFs, and we find them to be within the acceptable range.

## EMPIRICAL DESIGN

We use the following regression model to test the association between sentiment (*Sent*) and accrual-based earnings management (*AEM*).

$$AEM_{it} = \alpha_0 + \beta_0 Sent_{t-1} + \beta_1 Size_{it} + \beta_2 MB_{it} + \beta_3 ROA_{it} + \beta_4 Age_{it} + \beta_5 Beta_{it} + \beta_6 Lev_{it} + \beta_7 TS_{t-1} + \beta_8 INF_{t-1} + \beta_9 MR_{t-1} + \beta_{10} AEM_{it-1} + \epsilon_{it} \quad (7)$$

Where *AEM* indicates four proxies of unsigned abnormal accruals, i.e.,  $ABAC_{MJ}$ ,  $ABAC_{ROA}$ ,  $ABAC_{LGROA}$ , and  $ABAC_{PM}$ .  $Sent_{t-1}$  is the lag sentiment variable.  $Size_{it}$ ,  $MB_{it}$ ,  $ROA_{it}$ ,  $Age_{it}$ ,  $Beta_{it}$ , and  $Lev_{it}$  are firm specific control variables. The three macroeconomic control variables are  $TS_{t-1}$ ,  $INF_{t-1}$ , and  $MR_{t-1}$ . The lag

<sup>12</sup> We have also used market capitalization as alternative proxy of firm size, and our results are qualitatively similar.

<sup>13</sup> A Promoter can be defined as the founder of the firm or the one who belongs to the founding family. Our choice of institutional level control is driven by previous studies using Indian markets data (see, e.g., Balasubramanian et al., 2010; Bhagat and Bolton, 2008).

**Table 1.** Descriptive Statistics  
**Panel (A).** Firm Specific Variables

Variables	N	Mean	Std.		Minimum	Maximum	p25	p75
			Deviation					
ABAC <sub>MJt</sub>	9669	0.01	0.10		-0.41	0.47	-0.04	0.05
ABAC <sub>ROA<sub>t</sub></sub>	9669	-0.04	0.19		-1.02	0.61	-0.11	0.05
ABAC <sub>LGROA<sub>t</sub></sub>	9669	-0.05	0.19		-0.96	0.60	-0.12	0.04
ABAC <sub>PM<sub>t</sub></sub>	8548	0.00	0.15		-0.61	0.60	-0.07	0.07
Size <sub>t</sub>	9669	8.78	1.59		0.92	12.67	7.78	9.74
MB <sub>t</sub>	9669	2.33	2.99		0.10	20.19	0.65	2.77
ROA <sub>t</sub>	9669	10.57	7.79		-20.63	43.13	6.01	14.19
Age <sub>t</sub>	9669	3.41	0.59		1.10	5.04	3.00	3.85
Beta <sub>t</sub>	9669	1.03	0.38		0.18	2.07	0.76	1.27
Lev <sub>t</sub>	9669	13.41	19.33		0.01	113.92	2.32	15.95
I_Own <sub>t</sub>	9669	12.73	12.89		0.00	76.92	1.42	20.02
P_Own <sub>t</sub>	9669	54.72	15.63		0.00	99.59	44.89	66.48
CG1_Bsize <sub>t</sub>	9669	0.54	0.50		0.00	1.00	0.00	1.00
CG2_Bindip <sub>t</sub>	9669	0.39	0.49		0.00	1.00	0.00	1.00
CG3_Bmeet <sub>t</sub>	9669	0.41	0.49		0.00	1.00	0.00	1.00
CG4_BAttend <sub>t</sub>	9669	0.44	0.50		0.00	1.00	0.00	1.00
CG5_CGIndex <sub>t</sub>	9669	1.78	0.98		0.00	4.00	1.00	2.00
Big4	9669	0.29	0.45		0.00	1.00	0.00	1.00
MEETBEAT	9669	0.43	0.50		0.00	1.00	0.00	1.00
DPRT	9669	0.95	0.22		0.00	1.00	1.00	1.00

**Panel (B).** Sentiment Variables, Macro-economy, and Regulatory Quality Variables

Variables	N	Mean	Std.		Minimum	Maximum	p25	p75
			Deviation					
Sent <sub>t-1</sub>	9669	-0.02	0.09		-0.18	0.16	-0.09	0.04
ASent	9669	-0.19	1.43		-2.96	2.75	-1.25	0.65
BCI <sub>t-1</sub>	9669	-0.20	0.88		-1.38	1.40	-0.99	0.62
IA	9669	1.34	.42		.84	2.88	1.07	1.47
TS <sub>t-1</sub>	9669	0.96	1.07		-0.38	3.89	0.38	1.53
INF <sub>t-1</sub>	9669	7.83	3.81		2.20	15.20	4.40	11.90
MR <sub>t-1</sub>	9669	16.92	32.37		-43.20	92.35	-5.64	23.18
RQ <sub>t-1</sub>	9669	-0.06	0.12		-0.25	0.12	-0.17	0.03
DCompAct <sub>t-1</sub>	9669	0.26	0.44		0.00	1.00	0.00	1.00

**Note:** This table presents the descriptive statistics of all variables. Sent is the weighted average of the monthly sentiment index constructed following the Baker and Wurgler (2006) approach. ABAC<sub>MJ</sub>, ABAC<sub>ROA</sub>, ABAC<sub>LGROA</sub>, ABAC<sub>PM</sub> are firm-level abnormal accruals calculated. Firm-specific control variables are Size (log of total sales), MB (market-to-book ratio), ROA (return on asset), Age (years since incorporation), Beta (systematic risk following a market model regression), Lev (debt-to-equity ratio), ROA (return on assets), I\_Own (percentage of institutional ownership in shares), P\_Own (percentage of shares held by promoters), BoSize (board size, i.e., log of number of board members). CG1\_Bsize, CG2\_Bindip, CG3\_Bmeet, CG4\_BAttend are industry-year median adjusted four board characteristics, i.e., board size, board independence, board meeting frequency, and board attendance. CG5\_CGIndex is a composite governance index. Big4 is a dichotomous variable, one if audited by big four auditors or else zero. DPRT is a dummy variable for related party transactions. RQ is World Bank governance indicators index. DCompAct is a dummy variable, 1 for the period 2013-17 (post regulation reform) and zero otherwise. BCI is business confidence index data from the OECD data library, IA is Google search volume index (GSVI) for the keyword "BSE Sensex." IA sample starts from 2004 because of GSVI search engine data availability restriction. ASent is the alternative sentiment index with simple average approach (Section 3.2.1). MEETBEAT is an indicator variable set to one if the company meets or exceeds its latest Bloomberg analyst consensus. Macro-economic control variables are; TS (term spread), INF (inflation rate), and MR (market return). All the variables except Sent and Age have been winsorized at 1 percent level. P25 and P75 reports mean data for the 25<sup>th</sup> percentile and 75<sup>th</sup> percentile, respectively. Sample period is from 2000-2017. Appendix 1 provides description of all variables and their measurement.

**Table 2.** Correlation Matrix

Variables	Sent <sub>t-1</sub>	ABAC <sub>MJt</sub>	ABAC <sub>ROA</sub>	ABAC <sub>LROA</sub>	ABAC <sub>PM</sub>	Size <sub>t</sub>	MB <sub>t</sub>	ROA <sub>t</sub>	Age <sub>t</sub>	Beta <sub>t</sub>	Lev <sub>t</sub>	I_Own <sub>t</sub>	P_Own <sub>t</sub>	CG1_Bsize <sub>t</sub>	CG2_Bindip <sub>t</sub>	CG3_Bmeet <sub>t</sub>	CG4_BAttend	CG5_CGIndex	TS <sub>t-1</sub>	INF <sub>t-1</sub>	MR <sub>t-1</sub>	
Sent <sub>t-1</sub>	1																					
ABAC <sub>MJt</sub>	0.03*	1																				
ABAC <sub>ROA</sub>	0.02*	0.46*	1																			
ABAC <sub>LROA</sub>	0.01	0.49*	0.93*	1																		
ABAC <sub>PMt</sub>	0.03*	0.56*	0.35*	0.35*	1																	
Size <sub>t</sub>	0.04*	-0.14*	0.01	-0.01	-0.09*	1																
MB <sub>t</sub>	0.19*	0.04*	0.10*	0.07*	0.05*	0.19*	1															
ROA <sub>t</sub>	0.06*	0.03*	0.16*	0.12*	0.04*	0.19*	0.33*	1														
Age <sub>t</sub>	0.03*	-0.12*	-0.07*	-0.08*	-0.07*	0.27*	0.06*	0.06*	1													
Beta <sub>t</sub>	0.14*	-0.01	-0.09*	-0.08*	-0.02*	0.07*	-0.14*	-0.24*	-0.07*	1												
Lev <sub>t</sub>	0.01	-0.04*	-0.05*	-0.04*	-0.04*	0.35*	-0.06*	-0.14*	0.16*	0.15*	1											
I_Own <sub>t</sub>	0.06*	-0.09*	-0.07*	-0.08*	-0.04*	0.49*	0.19*	0.13*	0.18*	-0.05*	0.15*	1										
P_Own <sub>t</sub>	-0.02*	0.013	0.04*	0.03*	0.01	0.02	0.14*	0.08*	-0.01	-0.09*	-0.05*	-0.41*	1									
CG1_Bsize <sub>t</sub>	-0.05*	-0.07*	-0.04*	-0.05*	-0.03*	0.28*	0.07*	0.06*	0.15*	-0.07*	0.07*	0.23*	-0.04*	1								
CG2_Bindip <sub>t</sub>	0.15*	0.01	-0.01	-0.01	0.01	0.06*	0.04*	-0.01	0.07*	0.07*	0.03*	0.05*	-0.04*	-0.06*	1							
CG3_Bmeet <sub>t</sub>	0.14*	-0.03*	-0.02	-0.02	-0.02	-0.02*	0.01	-0.02	-0.02	0.08*	0.05*	-0.07*	0.06*	-0.02*	0.07*	1						
CG4_BAttend <sub>t</sub>	0.15*	-0.01	0.01	-0.01	-0.02	0.09*	0.08*	0.03*	0.05*	0.07*	0.02*	0.03*	0.02*	-0.09*	0.18*	-0.13*	1					
CG5_CGIndex <sub>t</sub>	0.20*	-0.05*	-0.03*	-0.04*	-0.03*	0.21*	0.09*	0.03*	0.13*	0.08*	0.08*	0.12*	0.01	0.43*	0.60*	0.46*	0.49*	1				
TS <sub>t-1</sub>	0.03*	0.02*	0.01	-0.01	0.03*	-0.04*	0.01	0.06*	-0.018	-0.03*	-0.04*	0.03*	-0.04*	0.02	0.02*	0.02	0.01	0.03*	1			
INF <sub>t-1</sub>	0.02	0.04*	0.05*	0.03*	0.04*	0.09*	-0.06*	-0.01	-0.02	0.12*	0.09*	-0.01	0.03*	-0.07*	0.13*	0.16*	0.15*	0.18*	0.28*	1		
MR <sub>t-1</sub>	0.24*	0.02*	0.04*	0.01	0.03*	-0.03*	0.10*	0.04*	-0.01	-0.04*	-0.03*	0.02*	-0.01	0.01	0.01	-0.01	-0.02	-0.02	0.36*	0.10*	1	

**Notes:** This table presents the correlation statistics between all the variables. Sample period is from 2000-2017. Variable description is same as in Table 1. For brevity and clarity in presentation we have included only the important variables in the correlation table. In our unreported results we test for multicollinearity by computing VIFs, and we find them to be within the acceptable range. \* Indicates statistical significance at 10% level.

dependent variable ( $AEM_{t-1}$ ) is included in the model to avoid omitted variable bias. We select a one-year lag effect of AEM following Simpson (2013).  $\varepsilon$  is a white noise term. It is likely that the business cycle affects investor sentiment (Benhabib et al., 2016; McLean and Zhao, 2014). Therefore, we use the lag values of macro-economic controls ( $TS_{t-1}$ ,  $INF_{t-1}$ , and  $MR_{t-1}$ ) along with  $Sent_{t-1}$  in our model consistent with the approach of Simpson (2013). The rationality to control for the lag macro-economic variables is to capture underlying economic factors that may be correlated with investor sentiment (Simpson, 2013) and to mitigate the effect of leading indicator property of business cycle variables (Bertomeu and Magee, 2011; Konchitchki and Patatoukas, 2014). We use the lag investor sentiment variable and lag business cycle proxies in the same regressions, so the effect of one is measured while controlling for other. Controlling the effect of lag macro-economic variables also helps to overcome the effect of business-cycle components on earnings management and investor sentiment.<sup>14</sup> We consider all firm-specific control variables at  $t$  consistent with the standard earnings management literature. We control for the industry fixed effects and the year fixed effects in equation (6)<sup>15</sup>. In equation (6), we hypothesize that managers indulge in a higher level of AEM following a period of positive market-wide sentiment, i.e.,  $\beta_{Sent_{t-1}} > 0$ . While estimating equation (6) for upward earnings management, i.e.,  $AEM > 0$  (downward, i.e.,  $AEM < 0$ ) one will expect a positive (negative) coefficient of  $Sent_{t-1}$ , i.e.,  $\beta_{ot-1} > 0$  ( $\beta_{ot-1} < 0$ ). We also account for cross-correlation by clustering the standard errors by the firm ( $i$ ) and year ( $t$ ). The Hausman test is used to differentiate between fixed effects model and the random effects model.

To examine the effect of corporate governance and the regulatory environment on the relationship between Sentiment and AEM we estimate the following equations:

$$AEM_{it} = \alpha_0 + \beta_0 Sent_{t-1} + \beta_1 Sent_{t-1} * RE + \beta_2 Size_{it} + \beta_3 MB_{it} + \beta_4 ROA_{it} + \beta_5 Age_{it} + \beta_6 Beta_{it} + \beta_7 Lev_{it} + \beta_8 I_{ownit} + \beta_9 P_{ownit} + \beta_{10} RE + \beta_{11} TS_{t-1} + \beta_{12} INF_{t-1} + \beta_{13} MR_{t-1} + \beta_{14} AEM_{it-1} + \varepsilon_{it} \quad (8)$$

$$AEM_{it} = \alpha_0 + \beta_0 Sent_{t-1} + \beta_1 Sent_{t-1} * CG_{it} + \beta_2 Size_{it} + \beta_3 MB_{it} + \beta_4 ROA_{it} + \beta_5 Age_{it} + \beta_6 Beta_{it} + \beta_7 Lev_{it} + \beta_8 I_{ownit} + \beta_9 P_{ownit} + \beta_{10} CG_{it} + \beta_{11} TS_{t-1} + \beta_{12} INF_{t-1} + \beta_{13} MR_{t-1} + \beta_{14} AEM_{it-1} + \varepsilon_{it} \quad (9)$$

Where AEM indicates four proxies of unsigned abnormal accruals, i.e.,  $ABAC_{MJ}$ ,  $ABAC_{ROA}$ ,  $ABAC_{LGROA}$ , and  $ABAC_{PM}$ .  $Sent_{t-1}$  is the lag sentiment variable.  $Size_{it}$ ,  $MB_{it}$ ,  $ROA_{it}$ ,  $Age_{it}$ ,  $Beta_{it}$ , and  $Lev_{it}$  are firm specific control variables. The three macroeconomic control variables are  $TS_{t-1}$ ,  $INF_{t-1}$ , and  $MR_{t-1}$ . The lag dependent variable ( $AEM_{t-1}$ ) is included in the model to avoid omitted variable bias.  $\varepsilon$  is a white noise term. In equation (7),  $RE$  shows the regulatory environment variables, i.e., regulatory change dummy variable ( $DCompAct_t$ ), and other provisions associated with regulatory change. The interpretation of  $Sent_{t-1} * DCompAct_t$  or  $Sent_{t-1} * RE_{t-1}$  coefficients in equation (7) allows us to find out the effect of  $Sent_{t-1}$  on AEM after the controlling for the effect of regulatory quality and regulatory changes ( $\beta_1$  and  $\beta_{10} < 0$ ). In equation (8),  $CG_{it}$  variable indicates the corporate governance variables ( $CG1\_Bsize$ ,  $CG2\_Bindip$ ,  $CG3\_Bmeet$ ,  $CG4\_BAttend$ ,  $CG5\_CGIndex$ ). In equation (8), we hypothesize that coefficient of  $\beta_1$  ( $Sent_{t-1} * CG_{it}$ ) and  $\beta_{10}$  ( $CG_{it}$ ), should be negative as better firm level governance and its associated monitoring effect may help to minimize the managerial opportunistic AEM following

<sup>14</sup> For instance, Konchitchki and Patatoukas (2014) document that aggregate accounting earnings growth positively predicts future GDP growth forecast errors, especially for the one-quarter ahead forecast horizon. Therefore, aggregate accounting earnings growth is an incrementally significant leading indicator of growth in nominal GDP. Furthermore, our sentiment index construction approach follows orthogonalization process unlike Simpson (2013). Therefore, the potential effect of macro-economic or business cycle proxies on prevailing sentiment level is low.

<sup>15</sup> Since  $Sent_{t-1}$  is a firm invariant variable, in our unreported results we also estimate equation (5) without year fixed effect, and our result holds.

a high sentiment period. Along with our standard control variables mentioned in equation (6), we also use shareholding percentage ( $I\_Own_t$  and  $P\_Own_t$ ) as control variables in the equation (7) and (8). We also examine the implication of sentiment ( $Sent_{t-1}$ ) for income-increasing (positive) and income-decreasing (negative) earnings management using signed abnormal accruals as our dependent variables.

## RESULTS DISCUSSION

This section presents our main empirical results and associated robustness tests. This section has been divided into four sub-sections to clarify the presentation better. Section 5.1 focuses on the sentiment and earnings management relationship and presents test results for alternative sentiment proxies and instrument variable approach. Section 5.2 discusses sentiment-induced upward (income increasing) and downward (income decreasing) earnings management. This section further elaborates on the implication of investor sentiment for managerial motives to shift from income-decreasing AEM to income-increasing AEM. Section 5.3 presents the impact of change in the regulatory environment with the introduction of the Companies Act 2013 on the sentiment and AEM relationships. This section provides an in-depth analysis pertinent to three crucial provisions of the Act, i.e., larger board, increased board independence, and stringent related party transaction norms. Furthermore, the robustness tests examine the implication of regulatory quality and the global financial crisis. Section 5.4 emphasizes the essence of the firm-level governance mechanism in the context of sentiment and AEM relationship. This sub-section also helps to draw our attention to the implications of audit quality and managerial motives to meet analyst earnings estimates.

## INVESTOR SENTIMENT AND EARNINGS MANAGEMENT

Table 3 presents the regression results of our first hypothesis. We estimate the regression equation (5) with and without the macroeconomic control variables. Reported results in Panel (A) and Panel (B) of Table 3 suggest that there is a positive association between unsigned  $AEM_{it}$  ( $ABAC_{ROA}$ ,  $ABAC_{LGROA}$ , and  $ABAC_{PM}$ ) and sentiment ( $Sent_{t-1}$ ). This association is robust to the presence of other firm-specific and macroeconomic control variables. Consistent with Simpson (2013), our results validate that during periods of high sentiment, managers tend to increase the magnitude of abnormal accruals. In the Panel (B) of Table 3,  $Sent_{t-1}$  coefficients for  $ABAC_{ROA}$ ,  $ABAC_{LGROA}$ , and  $ABAC_{PM}$  indicate that an increase in the sentiment by one percent, increases earnings management by 3.94% ( $t = 3.80$ ), 3.87% ( $t = 3.67$ ), and 2.45% ( $t = 3.08$ ), respectively. Overall, our results support the first hypothesis.

The negative and significant relationship between Size and AEM proxies indicates that smaller Indian firms engage more in earnings management than larger firms. Our findings are consistent with the argument that large-sized firms are more regulated with information available to the public at a lesser cost, thereby stalling them to engage in opportunistic AEM compared to small-sized firms (Bhattacharya, 2001). The negative Age coefficients indicate that younger firms engage more in AEM. Since younger firms are hard to value and difficult to arbitrage (Baker and Wurgler, 2006). Hence, higher chance to peruse managers to engage in AEM. The observed significant positive Lev effect indicates that the firm's debt policy enhances managerial motives for AEM (Anagnostopoulou and Tsekrekos, 2017). The positive impact of ROA on earnings management suggests that firms with better earnings performance exaggerate earnings more than those with relatively lower earnings performance (Lee et al., 2006). A positive and significant MB coefficient suggests that firms with higher valuations relative to their book value have more incentive to manage earnings through accruals (Skinner and Sloan, 2002).



Our empirical analysis reported in Panel (A), we only examine how previous period AEM measures affect AEM in the next period. However, the earnings quality of previous years might exert its impact on corporate AEM with a longer delay. To this end, we also examine how the previous AEM levels influence two-period-ahead (i.e., two-year-ahead) earnings management through accruals. Therefore, along with lag macro-economic controls as independent variables, estimation model used in Panel (B) of Table 3 has two-period-lag corporate AEM as additional control variable. In Panel (B) of Table 3 we find that our results are robust to the inclusion of lag macro-economic controls. These results suggest that the relationship between investor sentiment and AEM is not attributable to omitted business cycle factors. We observe a negative and significant effect of  $TS_{t-1}$  on majority of AEM proxies. We find that higher inflation in the previous year positively influences AEM. Results confirm with Bertomeu and Magee (2011) findings which suggest that financial reporting quality should reach its maximum when the economic condition is favourable and decrease as the economic conditions become less favourable. However, the marginal negative effect of  $Sent_{t-1}$  on AEM is lower with the inclusion of macro-economy or business cycle variables. We observe lower  $Sent_{t-1}$  coefficients ( $ABAC_{MJ}$ ,  $ABAC_{ROA}$ ,  $ABAC_{LGROA}$ ,  $ABAC_{PM}$ ) after the inclusion of lag macro-economic variables although their statistical significance remains the same as compared to Panel (A) of Table 3. As compared to our Panel (A) results, the absolute  $Sent_{t-1}$  coefficients in Panel (B) suggest that the standalone impact of sentiment on  $ABAC_{MJ}$  (coeff. = 0.0195,  $t = 2.55$ ),  $ABAC_{ROA}$  (coeff. = 0.054,  $t = 3.29$ ),  $ABAC_{LGROA}$  (coeff. = 0.0485,  $t = 2.82$ ), and  $ABAC_{PM}$  (coeff. = 0.0367,  $t = 2.84$ ) have been reduced by approximately 34%, 76%, 79%, and 70%, respectively. The observed effect can be attributable to the inter relationship between business cycle and investor sentiment (Binhai et al., 2016; McLean and Zhao, 2014). Existing behavioural asset pricing and corporate finance literature suggest that the time-varying sentiment effect is associated with the macroeconomic condition. In general, expansionary (recessionary) business cycle conditions are related to an optimistic (pessimistic) sentiment environment in the market (Binhai et al., 2016).

## ROBUSTNESS TESTS: ALTERNATIVE SENTIMENT PROXIES

This sub-section focusses whether our results are robust to the inclusion of alternative sentiment proxies. Given the related strand of behavioural finance literature argument that there is no perfect measure of investor sentiment (Baker and Wurgler, 2006; Zhou, 2018) it is therefore important to check the robustness of our results with alternative sentiment measures. Similar argument for robustness test with alternative sentiment measures also highlighted by related strand of literature in accounting and finance (Bergman and Roychowdhury, 2008; Brown et al., 2012; Simpson, 2013). Table 4 Panel (A, B, C, D) reports our robustness test results with four alternative sentiment measures. With alternative measures of sentiment ( $ASent$ ,  $Sent\_Dummy$ ,  $BCI$ ,  $IA$ ), reported results in Table 4 indicate that our findings are not subject to omitted variable bias<sup>16</sup>. Our results further confirm the notion that managerial motives for financial reporting are partially driven by the prevailing sentiment environment in the market.

## ROBUSTNESS TESTS: INSTRUMENT VARIABLE APPROACH

Sentiment and AEM relationship warrant fresh investigation in the context of emerging markets due to the potential endogeneity issues. On the side-lines of the growth of behavioural finance literature there is an emerging consensus that sentiment is contagious (Baker et al., 2012; Verma and Soydemir,

<sup>16</sup> Data for Google search volume index provided by Google trend is only available since 2004. Therefore, the reported results are subject to a lesser sample as compared to our main results.

**Table 3.** Impact of Sentiment on Accrual Earnings Management

Coefficients	Panel (A) Firm-Specific Control Variables				Panel (B) Firm and Macroeconomic Control Variables			
	ABAC <sub>MJ</sub>	ABAC <sub>ROA</sub>	ABAC <sub>LGROA</sub>	ABAC <sub>PM</sub>	ABAC <sub>MJ</sub>	ABAC <sub>ROA</sub>	ABAC <sub>LGROA</sub>	ABAC <sub>PM</sub>
<i>Sent</i> <sub>t-1</sub>	0.0294 (0.98)	0.226*** (3.38)	0.229*** (3.20)	0.121*** (2.85)	0.0195** (2.55)	0.0542*** (3.29)	0.0485*** (2.82)	0.0367*** (2.84)
<i>Size</i> <sub>it</sub>	-0.006*** (-6.40)	-0.0030 (-1.62)	-0.0037** (-2.03)	-0.0046*** (-2.88)	-0.00573*** (-6.32)	-0.00318* (-1.92)	-0.00386** (-2.33)	-0.0045*** (-2.96)
<i>MB</i> <sub>it</sub>	0.0014*** (2.91)	0.0026*** (3.43)	0.0017** (2.09)	0.0016*** (2.83)	0.00122*** (2.89)	0.00194*** (2.82)	0.00118 (1.63)	0.0012** (2.12)
<i>ROA</i> <sub>it</sub>	0.0005*** (3.16)	0.0022*** (7.26)	0.0019*** (5.92)	0.00047** (2.29)	0.000545*** (3.63)	0.00212*** (7.31)	0.00185*** (6.18)	0.00061*** (2.87)
<i>Age</i> <sub>it</sub>	-0.008*** (-4.84)	-0.014*** (-4.17)	-0.0144*** (-4.15)	-0.00405* (-1.78)	-0.0072*** (-4.56)	-0.0133*** (-4.26)	-0.0135*** (-4.17)	-0.00282 (-1.23)
<i>Beta</i> <sub>it</sub>	0.00069 (0.22)	-0.0091* (-1.73)	-0.0049 (-0.91)	-0.0039 (-0.82)	-0.00060 (-0.22)	-0.0147*** (-3.32)	-0.0114** (-2.43)	-0.00691 (-1.61)
<i>Lev</i> <sub>it</sub>	0.0001*** (2.84)	-0.000086 (-0.98)	-0.00006 (-0.68)	0.00001 (0.17)	0.00012*** (2.96)	-0.000062 (-0.81)	-0.00004 (-0.51)	0.000014 (0.23)
<i>TS</i> <sub>t-1</sub>					0.00282*** (3.62)	0.0106*** (7.23)	0.00885*** (5.86)	0.00582*** (4.57)
<i>INF</i> <sub>t-1</sub>					0.000121 (0.59)	-0.000079 (-0.19)	0.000020 (0.05)	-0.00037 (-1.11)
<i>MR</i> <sub>t-1</sub>					0.000021 (0.86)	0.000033 (0.68)	0.00013*** (2.62)	0.000011 (0.29)
ABAC <sub>MJ t-1</sub>	0.175*** (9.14)				0.160*** (9.34)			
ABAC <sub>MJ t-2</sub>					0.0840*** (6.45)			
ABAC <sub>ROA t-1</sub>		0.181*** (10.20)				0.162*** (10.69)		
ABAC <sub>ROA t-2</sub>						0.124*** (8.77)		
ABAC <sub>LRO At-1</sub>			0.195*** (10.73)				0.176*** (11.19)	
ABAC <sub>LRO At-2</sub>							0.114*** (8.30)	
ABAC <sub>PM t-1</sub>				0.0986*** (5.24)				0.100*** (5.88)
ABAC <sub>PM t-2</sub>								0.0595*** (4.19)
Intercept	0.134*** (11.72)	0.190*** (7.54)	0.200*** (7.52)	0.141*** (8.02)	0.127*** (13.13)	0.194*** (9.45)	0.203*** (9.12)	0.153*** (10.12)
Industry Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Effects#	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	9582	9540	9540	8140	9374	9304	9304	7683
R-square	0.111	0.159	0.140	0.092	0.113	0.162	0.142	0.081

**Notes:** This table presents the regression results of equation (6) for the four unsigned AEM proxies (ABAC<sub>MJ</sub>, ABAC<sub>ROA</sub>, ABAC<sub>LGROA</sub>, and ABAC<sub>PM</sub>) as dependent variables. Variable description is same as in Table 1. *Sent* is the annual sentiment index. Standard errors are two-way cluster-robust (Petersen, 2009). #In our unreported results we also estimate equation (6) without year fixed effect, and our results are qualitatively similar. \*, \*\*, \*\*\* indicates statistical significance at 10%, 5%, and 1% respectively. Variable description is available in Appendix 1.

**Table 4.** Alternative Sentiment Proxies and Earnings Management**Panel (A).** Alternative Sentiment Index (ASent)

Variables	ABAC <sub>MJ</sub>	ABAC <sub>ROA</sub>	ABAC <sub>LGROA</sub>	ABAC <sub>PM</sub>
ASent <sub>t-1</sub>	0.0150** (2.11)	0.0498*** (3.71)	0.0527*** (3.72)	0.0251** (2.33)
Controls	Yes	Yes	Yes	Yes
Industry Effects	Yes	Yes	Yes	Yes
Year Effects#	Yes	Yes	Yes	Yes
N@	9582	9540	9540	8140
R-sq.	0.111	0.159	0.140	0.092

**Panel (B).** Dummy Sentiment Variable

Variables	ABAC <sub>MJ</sub>	ABAC <sub>ROA</sub>	ABAC <sub>LGROA</sub>	ABAC <sub>PM</sub>
Sent_Dummy	0.00263* (1.76)	0.00639** (2.15)	0.00513* (1.68)	0.00286 (1.23)
Firm Controls	Yes	Yes	Yes	Yes
Industry Effects	Yes	Yes	Yes	Yes
Year Effects#	Yes	Yes	Yes	Yes
N@	9582	9540	9540	8140
R-sq.	0.106	0.147	0.130	0.080

**Panel (C).** Business Confidence<sub>t-1</sub> as Alternative Sentiment Proxy

Variables	ABAC <sub>MJ</sub>	ABAC <sub>ROA</sub>	ABAC <sub>LGROA</sub>	ABAC <sub>PM</sub>
BCI <sub>t-1</sub>	0.00443 (1.10)	4.651*** (3.80)	4.567*** (3.67)	3.037*** (3.24)
Industry Effects	Yes	Yes	Yes	Yes
Year Effects#	Yes	Yes	Yes	Yes
N@	9582	9540	9540	8142
R-sq.	0.111	0.159	0.140	0.092

**Panel (D).** Investor Attention as Alternative Sentiment Proxy

Variables	ABAC <sub>MJ</sub>	ABAC <sub>ROA</sub>	ABAC <sub>LGROA</sub>	ABAC <sub>PM</sub>
IA <sub>t-1</sub>	0.0004 (1.51)	0.0018*** (3.62)	0.0017*** (3.41)	0.0015*** (3.53)
Fixed Effects	Yes	Yes	Yes	Yes
Industry Effects	Yes	Yes	Yes	Yes
Year Effects#	7978	7953	7953	6900
R-sq.	0.113	0.173	0.156	0.093

**Notes:** This table reports estimation results of equation (6) with alternative sentiment measures. Other control variable description is same as Table 1. Panel (A) reports the result for alternative sentiment index (ASent) constructed through simple average method as described in Section 5.1.1. Panel (B) reports the result for Sent\_Dummy, i.e., an indicator variable coded 1 for high sentiment period and zero otherwise. Panel (C) reports robustness test results by using business confidence index (collected from OECD data library) as alternative sentiment proxy. Panel (D) reports robustness test results by using investor attention (IA) measured by Google trend search volume information as alternative proxy. IA sample starts from 2004. #In our unreported results we also estimate equation (5) without year fixed effect, and our results are qualitatively similar. t statistics are in parenthesis. Standard errors are two-way cluster-robust (Petersen, 2009). Variable description is available in Appendix 1. \*, \*\*, \*\*\* indicates statistical significance at 10%, 5%, and 1% respectively.

2006),<sup>17</sup> and developed markets sentiment influences other markets (Baker et al., 2012). Due to continuous trade integration and capital flow from foreign investors, there is a direct implication of developed market sentiment for emerging markets (Hudson and Green, 2015). It is, therefore,

<sup>17</sup> Baker et al. (2012) and Hudson and Green (2015) suggest that there can be three channels through which foreign country IS can impact market behaviour of another country, i.e., optimism about investment prospects in another country, shift towards the risky assets (international equity) of other country due to better expected return, optimism of foreign investors about their own country can influence the optimism of foreign country investors due to herd behaviour.

reasonable to assume that developed market sentiment may also have a contagious effect on emerging market sentiments. Existing studies which use Baker and Wurgler (2006) sentiment index or Michigan Consumer Confidence Index (for e.g., Simpson, 2013; Brown et al., 2012) may explicitly presume that sentiment of US stock market is not affected by other markets sentiment contagion, however it may not be a reasonable assumption for an emerging market. Consistent with the contagious investor sentiment argument of Baker et al. (2012), one may argue that our investor sentiment (*Sent*) proxy for India may not be purely exogenous. Our instrument variable approach for examining sentiment and AEM relationship complements to this argument. Therefore, we have used Baker and Wurgler (2006) sentiment index<sup>18</sup> of the US (*SentIt-1*) as an instrument variable in the GMM specification. The GMM approach, as it overcomes the problem of endogeneity and simultaneity bias (Arellano and Bond, 1991). The instrument variable (IV) regression results using GMM approach<sup>19</sup> in Table 5 suggest that the implication of sentiment on AEM is similar when we use IV regression and thus, further confirms opportunistic earnings management behaviour of managers.

**Table 5.** Investor Sentiment and Earnings Management: Instrument Variable Approach

Coefficients	ABAC <sub>MJ</sub>		ABAC <sub>ROA</sub>		ABAC <sub>LGROA</sub>		ABAC <sub>PM</sub>	
<i>SentIt</i> <sub>t-1</sub>	0.138*	(1.90)	0.423***	(2.98)	0.495***	(3.40)	0.269**	(2.39)
<i>Size</i> <sub>it</sub>	-0.005***	(-7.22)	0.004***	(2.61)	0.003**	(2.18)	-0.004***	(-3.61)
<i>MB</i> <sub>it</sub>	0.002***	(5.24)	0.004***	(6.10)	0.004***	(5.42)	0.002***	(3.60)
<i>ROA</i> <sub>it</sub>	0.001***	(3.95)	0.002***	(8.49)	0.002***	(6.60)	0.001*	(2.00)
<i>Age</i> <sub>it</sub>	-0.008***	(-5.36)	-0.010***	(-3.85)	-0.0107***	(-3.67)	-0.002	(-0.97)
<i>Beta</i> <sub>it</sub>	0.0006	(0.24)	-0.0010*	(-1.90)	-0.0037	(-0.71)	-0.0038	(-0.93)
<i>Lev</i> <sub>it</sub>	0.0002***	(2.71)	-0.0001	(-1.57)	-0.0001	(-1.32)	0.0001	(0.13)
<i>TS</i> <sub>t-1</sub>	0.006***	(3.33)	0.021***	(5.63)	0.020***	(5.25)	0.013***	(4.28)
<i>INF</i> <sub>t-1</sub>	-0.002*	(-1.80)	-0.006***	(-3.62)	-0.007***	(-4.18)	-0.004***	(-2.88)
<i>MR</i> <sub>t-1</sub>	-0.00001	(-1.03)	-0.0001	(-1.34)	0.0001	(0.09)	-0.0001	(-1.20)
ABAC <sub>MJ t-1</sub>	0.17***	(14.89)						
ABAC <sub>ROA t-1</sub>			0.17***	(12.79)				
ABAC <sub>LGROA t-1</sub>					0.18***	(13.95)		
ABAC <sub>PM t-1</sub>							0.09***	(6.65)
Intercept	0.17***	(6.82)	0.17***	(2.58)	0.19***	(2.82)	0.20***	(5.25)
Industry Effects	Yes		Yes		Yes		Yes	
Year Effects	Yes		Yes		Yes		Yes	
N	8638		8598		8598		7409	
R-square	0.107		0.157		0.131		0.075	

**Notes:** This table presents the regression results of instrument variable (*SentIt*) regression using GMM approach for the four earnings management proxies. Variable description is same as in Table 1. Sample period is from 2000-2017. *t* statistics are in parenthesis. *SentIt* the instrument variable is the Baker and Wurgler (2006) sentiment. We use *xtabond2* in STATA developed by Roodman (2009). We also report autocorrelations test results and instrument validity tests results. The validity of the use of instruments is checked using Sargan's (1958) test for over-identified restrictions, which tests for the correlation between instruments and model residuals. Variable description is available in Appendix 1. \*, \*\*, \*\*\* indicates statistical significance at 10%, 5%, and 1% respectively.

<sup>18</sup> Available at: <http://people.stern.nyu.edu/jwurgler/>

<sup>19</sup> We check for AR (1) and AR (2) for first order and second-order serial correlation in the first-differenced residuals, under the null hypothesis of no serial correlation. The Hansen test of over-identification is also examined under the null that all instruments are valid. The Diff-in-Hansen test of exogeneity is conducted under the null that instruments used for the equations in levels are exogenous. All these test results support the use of GMM. We do not report all results for the brevity.

## UPWARD AND DOWNWARD EARNINGS MANAGEMENT

This section emphasizes the implication of  $Sent_{t-1}$  upward (income increasing) and downward (income decreasing) earnings management. We use signed abnormal accruals as our dependent variable, i.e., positive (negative) values of AEM suggest an upward (downward) earnings management (Simpson, 2013). Panel (A) and Panel (B) of Table 6 report the estimation results for income-increasing and income-decreasing earnings management. Our results confirm that firms engage more in managing earnings during high sentiment periods as investors have a heightened sense of optimism that lowers the scrutiny level that would otherwise be done by them (Simpson, 2013). Our findings also complement the notion that firms' disclosure choices react strategically to the prevailing sentiment environment to influence investor expectations and sentiment-induced biases (Bergman and Roychowdhury, 2008). Our results recommend that managers inflate earnings in periods of higher sentiment (Simpson, 2013) because; earnings expectations play a substantial role in sentiment-driven overvaluation (Ali and Gurun, 2009; Seybert and Yang, 2012). Taken together, our results in Tables 6 suggest that there are significant incentives for managers to manage earnings upward (downward) through accruals when investor sentiment is optimistic (pessimistic).

## INVESTOR SENTIMENT AND EARNINGS MANAGEMENT SHIFTS

Our above-mentioned results recommend that managers inflate earnings in periods of higher sentiment (Simpson, 2013) because; earnings expectations play a substantial role in sentiment-driven overvaluation (Seybert and Yang, 2012). Conrad et al. (2002) document that firms have a greater tendency to manage earnings upward during good times because investor reaction to earnings disappointments is more adverse during good times. Thus, managers' desire to maintain upward earnings is expected to be more pronounced during positive sentiment period. Specifically, answering the question, whether firms that have income-decreasing accruals closest to shifting to income-increasing accruals are affected positively by investor sentiment would help to substantiate our results better.

In this sub-section, we conduct our robustness analysis for a smaller set of firms who shift from income-decreasing (downward) accruals to income-increasing (upward) accruals when there is an increase in market sentiment. In other words, we analyse firms that have shifted their AEM approach, i.e., shift from income-decreasing accruals to income-increasing accruals during  $t-1$  to  $t$  when sentiment is higher in period  $t$  as compared to  $t-1$ . This sub-sample test allows us to look at a firm that has shifted from downward to upward abnormal accruals following a high sentiment period. The reported results in Table 7 suggests a positive and significant coefficient of  $Sent_{t-1}$  for  $ABAC_{ROA}$  (coeff. = 4.228,  $t = 2.33$ ) and  $ABAC_{LROA}$  (coeff. = 3.391,  $t = 1.67$ ). Consistent with Simpson's (2013) findings, our sub-sample analysis suggests that sentiment partially explains firms' motives to shift from income-decreasing to income-increasing accruals.

## SENTIMENT AND EARNINGS MANAGEMENT: ROLE OF COMPANIES ACT

Panel (A) and (B) of Table 8 reports the estimation results of equation (7). Our analysis aims to capture the effect of change in the regulatory environment ( $DCompAct$ ) on the sentiment induced opportunistic AEM behavior. Reported results (Table 8) for  $DCompAct_t$  found to be negative and significant for unsigned  $ABAC_{MJ}$  (coeff. = -0.013,  $t = -4.76$ ),  $ABAC_{ROA}$  (coeff. = -0.055,  $t = -10.99$ ),  $ABAC_{LROA}$  (coeff. = -0.048,  $t = -9.55$ ), and  $ABAC_{PM}$  (coeff. = -0.033,  $t = -8.58$ ). We also find a negative and statistically significant coefficient of  $Sent_{t-1} * DCompAct_t$  for all the four proxies of abnormal

**Table 6.** Impact of Investor Sentiment on Upward and Downward Accrual Earnings Management

Coefficients	Panel (A) Upward Accrual Earnings Management				Panel (B) Downward Accrual Earnings Management			
	ABAC <sub>MJ</sub>	ABAC <sub>ROA</sub>	ABAC <sub>LGROA</sub>	ABAC <sub>PM</sub>	ABAC <sub>MJ</sub>	ABAC <sub>ROA</sub>	ABAC <sub>LGROA</sub>	ABAC <sub>PM</sub>
Sent <sub>t-1</sub>	-0.0624 (-0.08)	4.345*** (3.35)	3.677*** (2.69)	2.065* (1.91)	-1.976*** (-2.82)	-4.593*** (-3.11)	-5.224*** (-3.32)	-3.372*** (-3.03)
Size <sub>it</sub>	-0.0069*** (-6.12)	-0.00867*** (-3.70)	-0.0103*** (-4.73)	-0.00418** (-2.47)	0.00782*** (4.58)	0.00121 (0.45)	0.00142 (0.50)	0.00603*** (2.34)
MB <sub>it</sub>	0.00169** (2.14)	0.00187* (1.82)	0.00151 (1.47)	0.00212** (2.32)	-0.00157*** (-2.91)	-0.00249** (-2.39)	-0.00151 (-1.32)	-0.00169** (-2.29)
ROA <sub>it</sub>	0.0011*** (5.04)	0.000031 (0.08)	0.000597* (1.70)	0.000409 (1.36)	0.000120 (0.55)	-0.00339*** (-7.14)	-0.00266*** (-5.50)	-0.00053* (-1.77)
Age <sub>it</sub>	-0.0115*** (-4.50)	-0.00932** (-2.11)	-0.00877** (-2.02)	-0.00603* (-1.71)	0.00824*** (3.71)	0.0207*** (4.23)	0.0210*** (4.06)	0.00317 (1.01)
Beta <sub>it</sub>	0.00006 (0.01)	0.00365 (0.55)	0.0103 (1.45)	-0.00647 (-1.12)	-0.000706 (-0.15)	0.0158* (1.93)	0.0161* (1.85)	0.00288 (0.41)
Lev <sub>it</sub>	0.0002*** (2.72)	0.00002 (0.17)	0.00003 (0.23)	-0.00002 (-0.23)	-0.00006 (-1.12)	0.00011 (0.86)	0.00013 (0.95)	-0.00005 (-0.51)
TS <sub>t-1</sub>	0.00727 (0.09)	-0.4330*** (-3.26)	-0.3630*** (-2.59)	-0.199* (-1.79)	0.197*** (2.76)	0.451*** (3.01)	0.511*** (3.21)	0.345*** (2.99)
INF <sub>t-1</sub>	-0.00006 (-0.19)	0.0025*** (4.36)	0.0022*** (3.77)	0.0011** (2.43)	-0.00095*** (-2.91)	-0.00186*** (-2.86)	-0.00226*** (-3.25)	-0.00138*** (-3.00)
MR <sub>t-1</sub>	0.00117* (1.79)	0.00159 (1.40)	0.00154 (1.31)	0.00112 (1.23)	-0.000794 (-1.35)	-0.00456*** (-4.46)	-0.00537*** (-4.92)	-0.00197** (-2.20)
ABAC <sub>MJ t-1</sub>	0.0256 (1.28)				0.0096 (0.65)			
ABAC <sub>ROA t-1</sub>		-0.0312** (-2.05)				0.0501*** (2.93)		
ABAC <sub>LGROA t-1</sub>			-0.0279** (-1.98)				0.0660*** (3.53)	
ABAC <sub>PM t-1</sub>				0.0299** (2.06)				0.0093 (0.68)
Intercept	0.146*** (2.69)	0.509*** (5.73)	0.468*** (4.99)	0.301*** (4.13)	-0.297*** (-6.23)	-0.543*** (-5.65)	-0.607*** (-5.79)	-0.377*** (-4.91)
Industry Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Effects#	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	5032	3618	3816	3994	4550	5922	5724	4146
R-square	0.087	0.100	0.079	0.079	0.101	0.178	0.150	0.093

**Notes:** This table presents the regression results of equation (6) for the four signed (income-increasing or income-decreasing) abnormal accrual proxies (ABAC<sub>MJ</sub>, ABAC<sub>ROA</sub>, ABAC<sub>LGROA</sub>, and ABAC<sub>PM</sub>) incorporating their sign, i.e., positive (income increasing) and negative (income decreasing). Panel (A) and Panel (B) presents the upward (income increasing) and downward (income decreasing) abnormal accrual estimation results. Sent is the annual sentiment index. Variable description is same as in Table 1. #In our unreported results we also estimate equation (7) without year fixed effect, and our results are qualitatively similar. Sample period is from 2000-2017. t statistics are in parenthesis. Standard errors are two-way cluster-robust (Petersen, 2009). \*, \*\*, \*\*\* indicates statistical significance at 10%, 5%, and 1% respectively.

**Table 7.** Investor Sentiment and Earnings Management Shifting (Downward to Upward)

Coefficients	ABAC <sub>MJ</sub>		ABAC <sub>ROA</sub>		ABAC <sub>LGROA</sub>		ABAC <sub>PM</sub>	
<b>Sent</b> <sub>t-1</sub>	-0.070	(-0.05)	4.228**	(2.33)	3.391*	(1.67)	0.330	(0.19)
<b>Size</b> <sub>it</sub>	-0.007***	(-4.06)	-0.010***	(-3.20)	-0.014***	(-5.46)	-0.005**	(-2.04)
<b>MB</b> <sub>it</sub>	0.0008	(0.72)	0.0001	(0.11)	0.0008	(0.58)	-0.00009	(-0.08)
<b>ROA</b> <sub>it</sub>	0.0015***	(3.66)	-0.0003	(-0.45)	0.0006	(1.03)	0.00097*	(1.95)
<b>Age</b> <sub>it</sub>	-0.0050	(-1.25)	0.0005	(0.09)	0.0007	(0.13)	-0.0059	(-1.10)
<b>Beta</b> <sub>it</sub>	0.0132*	(1.71)	0.0132	(1.20)	0.0219*	(-1.54)	0.00665	(0.66)
<b>Lev</b> <sub>it</sub>	0.0003**	(2.22)	0.0003**	(2.07)	0.0006***	(2.90)	-0.00012	(-0.75)
<b>TS</b> <sub>t-1</sub>	0.0177	(0.12)	-0.420**	(-2.26)	-0.333	(-1.23)	-0.0121	(-0.07)
<b>INF</b> <sub>t-1</sub>	-0.0009	(-1.40)	0.0035***	(3.64)	0.0035***	(3.37)	-0.00077	(-0.82)
<b>MR</b> <sub>t-1</sub>	0.0056***	(4.47)	-0.0031	(-1.23)	-0.0038*	(-1.72)	0.0062**	(2.22)
<b>ABAC</b> <sub>MJ t-1</sub>	-0.15***	(-3.47)						
<b>ABAC</b> <sub>ROA t-1</sub>			-0.098***	(-3.70)				
<b>ABAC</b> <sub>LGROA t-1</sub>					-0.089***	(-3.78)		
<b>ABAC</b> <sub>PM t-1</sub>							-0.082**	(-2.41)
<b>Industry Effects</b>	Yes		Yes		Yes		Yes	
<b>Year Effects#</b>	Yes		Yes		Yes		Yes	
<b>N</b>	1309		1216		1257		1202	
<b>R-sq.</b>	0.117		0.197		0.165		0.101	

**Notes:** This table reports a subsample analysis to examine test whether the firms that have income-decreasing (downward) accruals closest to shifting to income-increasing (upward) accruals are affected positively by investor sentiment. Variable description is same as in Table 1. The sample period is from 2000-2017 (\*except for Panel B results, where sample starts from 2004). #In our unreported results we also estimate equation (6) without year fixed effect, and our results are qualitatively similar. t statistics are in parenthesis. Standard errors are two-way cluster-robust (Petersen, 2009). \*, \*\*, \*\*\* indicates statistical significance at 10%, 5%, and 1% respectively.

accruals ABAC<sub>MJ</sub> (coeff. = -0.104, t = -2.57), ABAC<sub>ROA</sub> (coeff. = -0.392, t = -5.49), ABAC<sub>LGROA</sub> (coeff. = -0.361, t = -4.81), and ABAC<sub>PM</sub> (coeff. = -0.289, t = -4.92). Our findings support the hypothesis that the impact of sentiment on AEM will be lower as managers will perceive lesser incentives and more scrutiny in the aftermath of regulatory change (Aono and Guan, 2008; Cohen et al., 2008). This can be reasoned as the influence of Companies Act 2013, which along with other provisions, has brought improved auditor norms that increases the chance of detecting any earnings management via accruals and thus reduces a managers' motivation to do so. Our findings concur with the Aono and Guan (2008) observation that a stringent regulatory environment hinders managerial opportunism, measured by earnings management through accruals. Taken together, our results confirm the third hypothesis.

The Companies Act 2013 has been developed with a view to enhance self-regulation with added business-friendly corporate guidelines, improve corporate governance norms, enhance accountability on the part of corporates and auditors, raise levels of transparency, and to protect interests of investors, particularly small investors. Table 9 focusses on the implication of two important provisions (Section 149 and 188) of the Act with respect to board size, independent director, and related party transactions. In our analysis we split our sample period into two sub-periods, i.e., before companies Act (2000-2012) implementation and after companies Act (2013-2017) implementation. Panel (A), (B), and (C) of Table 9 emphasizes the implications of important regulatory provisions on the sentiment and AEM relationship.

Panel (A) of Table 9 summarizes the effect of an increase in board size per and post-enactment of the Companies Act 2013. However, the individual coefficients of DB\_Size and the Sent reflect only individual effects on AEM. To measure the combined impact, we focus on DB\_Size. We can observe

**Table 8.** Sentiment and Earnings Management: Regulatory Change (Companies Act 2013)

Coefficients	ABAC <sub>MJ</sub>		ABAC <sub>ROA</sub>		ABAC <sub>LGROA</sub>		ABAC <sub>PM</sub>	
<b>Sent<sub>t-1</sub></b>	0.0165*	(1.87)	0.0316*	(1.71)	0.03	(1.51)	0.028*	(2.25)
<b>Sent<sub>t-1</sub></b> <b>* DCompAct<sub>i</sub></b>	-0.104**	(-2.57)	-0.392***	(-5.49)	-0.361***	(-4.81)	-0.289***	(-4.92)
<b>DCompAct<sub>i</sub></b>	-0.0128***	(-4.76)	-0.0548***	(-10.99)	-0.0476***	(-9.55)	-0.0332***	(-8.58)
<b>Size<sub>it</sub></b>	-0.0054***	(-4.76)	0.00246	(1.13)	0.0017	(0.77)	-0.0044**	(-2.42)
<b>MB<sub>it</sub></b>	0.0016***	(3.48)	0.0036***	(4.87)	0.0027***	(3.35)	0.002***	(3.54)
<b>ROA<sub>it</sub></b>	0.00049***	(3.22)	0.0022***	(7.20)	0.0018***	(5.78)	0.00048**	(2.31)
<b>Age<sub>it</sub></b>	-0.0079***	(-4.69)	-0.0123***	(-3.74)	-0.0129***	(-3.76)	-0.0033	(-1.44)
<b>Beta<sub>it</sub></b>	0.00062	(0.21)	-0.0126**	(-2.46)	-0.00961*	(-1.84)	-0.0023	(-0.51)
<b>Lev<sub>it</sub></b>	0.00012***	(2.97)	-0.00008	(-0.91)	-0.000055	(-0.64)	0.000023	(0.38)
<b>I_Own<sub>it</sub></b>	-0.0002**	(-2.28)	-0.0012***	(-7.11)	-0.0012***	(-6.94)	-0.0001	(-0.82)
<b>P_Own<sub>it</sub></b>	-0.00007	(-1.21)	-0.0003***	(-2.74)	-0.0004***	(-2.86)	0.00002	(0.21)
<b>TS<sub>t-1</sub></b>	0.0013	(1.09)	0.0025	(0.98)	0.0026	(0.99)	0.0027	(1.51)
<b>INF<sub>t-1</sub></b>	0.00048**	(2.11)	0.0012***	(2.64)	0.00094*	(1.91)	0.00019	(0.54)
<b>MR<sub>t-1</sub></b>	-0.000001	(-0.02)	-0.00003	(-0.61)	0.00006	(1.20)	-0.00002	(-0.58)
<b>ABAC<sub>MJ t-1</sub></b>	0.176***	(9.13)						
<b>ABAC<sub>ROA t-1</sub></b>			0.176***	(9.96)				
<b>ABAC<sub>LGROA t-1</sub></b>					0.191***	(10.62)		
<b>ABAC<sub>PM t-1</sub></b>							0.10***	(5.34)
<b>Intercept</b>	0.137***	(12.25)	0.207***	(8.52)	0.218***	(8.45)	0.159***	(9.32)
<b>Industry Effects</b>	Yes		Yes		Yes		Yes	
<b>N</b>	9582		9540		9540		8140	
<b>R-square</b>	0.109		0.161		0.142		0.087	

**Notes:** This table presents the regression results of equation (7) for the four unsigned AEM proxies (ABAC<sub>MJ</sub>, ABAC<sub>ROA</sub>, ABAC<sub>LGROA</sub>, ABAC<sub>PM</sub>) as dependent variables. *Sent* is the annual sentiment index. Variable description is same as in Table 1. Dummy variable *DCompAct* takes a value one for the period 2013-17 (post regulation reform, i.e., introduction of Indian Companies Act 2013) and zero otherwise (2000-12). Standard errors are two-way cluster-robust (Petersen, 2009). \*, \*\*, \*\*\* indicates statistical significance at 10%, 5%, and 1% respectively

that the coefficients of  $Sent_{t-1} * DB\_Size$  are negative and statistically significant (ABAC<sub>ROA</sub>, ABAC<sub>LGROA</sub>) after implementing the Companies Act 2013. Moreover, the coefficients are also negative and significant. Results confirm that firms have benefited from an increase in board size. We observe that sentiment induced AEM is mitigated when a firm increases board size. This effect is visible in the post-regulation period (2013-2017). This confirms that after the Companies Act, the board of directors has become more vigilant and plays an essential role in controlling earnings management behavior. This finding is consistent with Jackling and Johl (2009) and Arora and Sharma's (2016) views which suggest that in the context of the Indian corporate sector, the application of resource dependency theory for larger board size is more appropriate. Second, larger boards are positively associated with lower earnings management, the integrity of financial reporting, level of firm voluntary disclosure, and firm performance (Cheng and Courtenay, 2006; Chauhan et al., 2016; Jackling and Johl, 2009; Peasnell et al., 2005; Sarkar et al., 2008; Xie et al., 2003).

In Panel (B) of Table 9, the coefficients of  $Sent_{t-1} * DB\_Ind$  are negative and statistically significant (ABAC<sub>ROA</sub>, ABAC<sub>LGROA</sub>) for the period associated with the post-enactment of the Companies Act 2013. We do not find any such implications during the period 2000-2012. Therefore, consistent with our hypotheses H2a and H2b, we propose that better governance mechanisms like larger board size and increased board independence moderate the effect of sentiment on managers' opportunistic behavior



**Table 9.** Implications of Board Size, Board Independence, and Related Party Transactions  
**Panel (A).** Implication of Board Size Provision

	Before Companies Act (2000-2012)				After Companies Act (2013-2017)			
	ABAC <sub>MJ</sub>	ABAC <sub>ROA</sub>	ABAC <sub>LGROA</sub>	ABAC <sub>PM</sub>	ABAC <sub>MJ</sub>	ABAC <sub>ROA</sub>	ABAC <sub>LGROA</sub>	ABAC <sub>PM</sub>
<b>Sent<sub>t-1</sub></b>	0.023*** (2.73)	0.063*** (3.71)	0.0544*** (3.05)	0.0452*** (3.30)	-0.410 (-1.44)	-1.271** (-2.32)	-1.734*** (-2.85)	-0.141 (-0.32)
<b>DB_Size</b>	0.0044 (1.55)	0.00295 (0.54)	0.00261 (0.47)	0.00287 (0.70)	0.00789 (1.48)	-0.0163* (-1.88)	-0.0102 (-1.11)	-0.00508 (-0.74)
<b>Sent<sub>t-1</sub> *</b>	-0.0241 (-0.99)	-0.029 (-0.50)	-0.0380 (-0.66)	-0.0698* (-1.74)	0.0373 (0.32)	-0.503*** (-2.69)	-0.404** (-2.10)	-0.216 (-1.50)
<b>DB_Size</b>	0.147*** (10.47)	0.205*** (6.95)	0.218*** (6.92)	0.165*** (7.31)	0.0844*** (2.79)	0.101* (1.93)	0.0716 (1.24)	0.135*** (3.03)
<b>Firm Controls</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Macro Controls</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Lag AEM</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Industry FE</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>N</b>	7172	7136	7136	6013	2410	2404	2404	2127
<b>R-sq</b>	0.113	0.153	0.135	0.082	0.116	0.166	0.145	0.110

**Panel (B).** Board Independence Provision

	Before Companies Act (2000-2012)				After Companies Act (2013-2017)			
	ABAC <sub>MJ</sub>	ABAC <sub>ROA</sub>	ABAC <sub>LGROA</sub>	ABAC <sub>PM</sub>	ABAC <sub>MJ</sub>	ABAC <sub>ROA</sub>	ABAC <sub>LGROA</sub>	ABAC <sub>PM</sub>
<b>Sent<sub>t-1</sub></b>	0.0294* (1.94)	0.0731** (2.52)	0.0689** (2.30)	0.0423* (1.93)	-0.405 (-1.41)	-1.190** (-2.14)	-1.646*** (-2.65)	-0.178 (-0.39)
<b>DB_Ind</b>	-0.00118 (-0.58)	-0.00169 (-0.43)	-0.00104 (-0.25)	0.00153 (0.50)	-0.000065 (-0.02)	-0.0167** (-2.56)	-0.0164** (-2.45)	0.00172 (0.30)
<b>Sent<sub>t-1</sub> *</b>	-0.0143 (-0.76)	-0.0209 (-0.60)	-0.0287 (-0.78)	-0.00743 (-0.27)	-0.0215 (-0.26)	-0.376*** (-2.83)	-0.385*** (-2.78)	0.0201 (0.18)
<b>DB_Ind</b>	0.148*** (10.22)	0.205*** (6.81)	0.218*** (6.77)	0.163*** (6.98)	0.0841*** (2.78)	0.104** (1.97)	0.0745 (1.28)	0.134*** (2.97)
<b>Firm Controls</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Macro Controls</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Lag AEM</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Industry FE</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>N</b>	7172	7136	7136	6013	2410	2404	2404	2127
<b>R-sq</b>	0.113	0.153	0.135	0.082	0.116	0.166	0.146	0.110

**Table 9.** Continued  
**Panel (C).** Related Party Transactions (RPT) Provision

	Before Companies Act (2000-2012)				After Companies Act (2013-2017)			
	ABAC <sub>MJ</sub>	ABAC <sub>ROA</sub>	ABAC <sub>LGROA</sub>	ABAC <sub>PM</sub>	ABAC <sub>MJ</sub>	ABAC <sub>ROA</sub>	ABAC <sub>LGROA</sub>	ABAC <sub>PM</sub>
<b>Sent<sub>t-1</sub></b>	0.00773 (0.33)	-0.0488 (-0.93)	-0.0123 (-0.22)	-0.0664 (-1.56)	-0.322 (-0.62)	-0.931 (-1.04)	-1.374 (-1.42)	-0.224 (-0.23)
<b>DRPT</b>	0.0076** (1.98)	0.0109 (1.40)	0.00599 (0.74)	0.00844 (1.33)	-0.00862 (-0.35)	-0.0321 (-0.76)	-0.0228 (-0.53)	-0.0123 (-0.26)
<b>Sent<sub>t-1</sub> * DRPT</b>	0.0219 (0.81)	0.141** (2.36)	0.0809 (1.28)	0.129*** (2.80)	-0.0850 (-0.20)	-0.397 (-0.55)	-0.407 (-0.55)	0.0637 (0.07)
<b>Intercept</b>	0.142*** (10.04)	0.199*** (6.69)	0.215*** (6.66)	0.161*** (7.03)	0.0929** (2.51)	0.131** (2.02)	0.0932 (1.33)	0.146** (2.22)
<b>Firm Controls</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Macro Controls</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Lag AEM</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Industry FE</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>N</b>	7172	7136	7136	6013	2410	2404	2404	2127
<b>R-sq</b>	0.113	0.154	0.135	0.084	0.116	0.164	0.144	0.110

**Notes:** This table presents the regression results of equation (7) for the four unsigned AEM proxies (ABAC<sub>MJ</sub>, ABAC<sub>ROA</sub>, ABAC<sub>LGROA</sub>, ABAC<sub>PM</sub>) as dependent variables. *Sent* is the annual sentiment index. We split our sample into sub-periods, i.e., before (2000-2012) and after Companies Act (2013-2017). Variable description is same as in Table 1. Dummy variable *DB\_Size* indicate firms as 1 if they increase board size and zero if they do not change or decrease the board size. *DB\_Ind* dummy variable represent firms as 1 if they show increase in proportion of independent directors and zero if they do not change or decrease the proportion of independent directors before and after the enactment of the Act. *DRPT* dummy variable indicates value of 1 to the firms who do RPT and zero to the firms who do not indulge into RPT based on their annual report disclosure. Standard errors are two-way cluster-robust (Petersen, 2009). \*, \*\*, \*\*\* indicates statistical significance at 10%, 5%, and 1% respectively.

for earnings management. In Panel (C) of Table 9, the positive *Sent<sub>t-1</sub> \* DRPT* coefficients (ABAC<sub>ROA</sub>, ABAC<sub>PM</sub>) suggest that firms were engaging with more RPT used to do more sentiment induced AEM before implementing the regulation. This effect is not visible post-regulation. In other words, a better regulatory environment with improved corporate governance practices mitigates the adverse impact of RPTs. Our results are consistent with observations made by Chauhan et al. (2016) and Islam (2020), which suggest that firms following good corporate governance practices have less impact on firms' future operating performance due to RPTs. Results further support the notion that improved governance characteristics like larger board and increased board (Section 149.3), independence (Section 149.4), and stringent RPT norms (Section 188) help to monitor corporate behavior that is in the best interests of the stakeholders and helps to improve reported earnings quality. This shows the effectiveness of change in the regulatory environment for mitigating opportunistic earnings management activity of managers with an exogenous effect of market sentiment.

## ADDITIONAL ROBUSTNESS TESTS

### IMPLICATION OF REGULATORY QUALITY AND FINANCIAL CRISIS

In Panel (A) of Table 10 we notice a negative and significant coefficient for RQ for ABAC<sub>MJ</sub> (coeff. = -0.057, *t* = -2.06), ABAC<sub>ROA</sub> (coeff. = -0.112, *t* = -2.05), and ABAC<sub>PM</sub> (coeff. = -0.094, *t* = -2.28). However,

our interaction effect coefficients, i.e.,  $Sent_{t-1} * RQ_{t-1}$  appear insignificant for all the AEM measures. With RQ's inclusion in our model, we notice a monotonic decline in the significant effect of sentiment on the AEM. Overall, our results support the notion that institutional and regulatory factors affect earnings management and reporting quality (Enomoto et al., 2015; Leuz et al., 2003), thus reduces the managerial motives to increase the abnormal accruals following optimistic sentiment periods. Reported results in Panel (B) of Table 10 suggest that in the post-crisis period there is a decline in the sentiment induced AEM measures  $ABAC_{ROA}$  (coeff. = -0.0143,  $t = -4.18$ ),  $ABAC_{LGROA}$  (coeff. = -0.015,  $t = -4.20$ ),  $ABAC_{PM}$  (coeff. = -0.0117,  $t = -4.37$ ). Our results are consistent with the findings of Kumar and Vij (2017). Our results related to the interaction variable  $Sent * GFCDummy$  appears to be negative and significant for all the three AEM measures. However, the  $Sent_{t-1}$  coefficient is positive and significant for all their AEM measures ( $ABAC_{ROA}$ ,  $ABAC_{LGROA}$ ,  $ABAC_{PM}$ ). Our marginal effect analysis indicates that the impact of the sentiment on AEM is moderated in the post-crisis period. Our results support Filip and Raffournier's (2014) findings, which suggest that due to an increase in accounting figures' value relevance and timeliness there is a decrease in income smoothing in the aftermath of global crisis.

## SENTIMENT AND EARNINGS MANAGEMENT: ROLE OF CORPORATE GOVERNANCE

In this section we focus on the firm level corporate governance measures to moderate the effect of sentiment on AEM. Panel (A), (B), (C), (D), and (E) of Table 11 report our estimation results for equation (6). Across all the panels, even after controlling the firm-level governance measures ( $CG1\_Bsize$ ,  $CG2\_Bindip$ ,  $CG3\_Bmeet$ ,  $CG4\_BAttend$ , and  $CG5\_CGIndex$ ), we observe a positive and significant effect of sentiment on most AEM measures. We find a negative and significant impact of the  $CG1\_Bsize$  and  $CG3\_Bmeet$  on the AEM measures ( $ABAC_{ROA}$ ,  $ABAC_{LGROA}$ , and  $ABAC_{PM}$ ) in Panel (A) and (C), respectively. In this regard, our results support the Jackling and Johl (2009) and Arora and Sharma (2016) findings which suggest that in the context of the Indian corporate sector, the application of resource dependency theory for larger board size is more appropriate. Moreover, firms with larger boards have lesser earnings management activity (Cheng and Courtenay, 2006; Dalton et al., 1999; García-Meca and Sánchez-Ballesta, 2009; Peasnell et al., 2005). Our aggregate measure for the board-level governance, i.e.,  $CG5\_CGIndex$ , appears to be negative and significant for all the AEM measures.

Our results reinforce existing findings, which suggest that a better firm-level governance structure minimizes opportunistic earnings management activities. Although the negative sign of  $Sent_{t-1} * CG1\_Bsize_t$ ,  $Sent_{t-1} * CG3\_Bmeet_t$ , and  $Sent_{t-1} * CG5\_CGIndex_t$  for unsigned abnormal accruals are consistent with our hypothesis, they fail to provide a statistically significant interpretation. Overall, our results from Table 4 suggest that although firm-level governance mechanisms matter for restricting earnings management motives, the prevailing market-wide sentiment effect is found to be stronger for AEM. To briefly summarise, the sentiment effect on managerial motives to have abnormal accruals fails to be moderated by the presence of board level governance mechanism. Furthermore, we examine whether corporate governance mechanism affects the sentiment induced managerial motives to shift from income-decreasing (downward) to income-increasing (upward) earnings management. Table 12 reports the implication of firm-level corporate governance on the upward and downward earnings management. Panel (A), (B), (C), (D), and (E) of Table 12 report our results for five firm-level governance variables, i.e.,  $CG1\_Bsize$ ,  $CG2\_Bindip$ ,  $CG3\_Bmeet$ ,  $CG4\_BAttend$ , and  $CG5\_CGIndex$ . Across all panels,  $Sent_{t-1}$  is having a positive effect on the upward earnings management, irrespective of the firm-level governance controls. The governance variable's moderating effect appears to be less significant to control the influence of investor sentiment on the

**Table 10.** Implication of Regulatory Quality and Financial Crisis  
**Panel (A).** Regulatory Quality and Earnings Management

	ABAC <sub>MJ</sub>		ABAC <sub>ROA</sub>		ABAC <sub>LGROA</sub>		ABAC <sub>PM</sub>	
Sent <sub>t-1</sub>	0.0242	(0.59)	0.128	(1.48)	0.186**	(2.01)	0.076	(1.22)
Sent <sub>t-1</sub> * RQ <sub>t-1</sub>	-0.0684	(-0.58)	0.0522	(0.21)	0.292	(1.12)	-0.014	(-0.08)
RQ <sub>t-1</sub>	-0.0565**	(-2.06)	-0.112**	(-2.05)	-0.0837	(-1.47)	-0.094**	(-2.28)
Size <sub>it</sub>	-0.0055***	(-4.88)	0.0020	(0.93)	0.0013	(0.60)	-0.0046**	(-2.57)
MB <sub>it</sub>	0.0015***	(3.21)	0.0029***	(3.89)	0.0021**	(2.58)	0.0016***	(2.78)
ROA <sub>it</sub>	0.00051***	(3.42)	0.0023***	(7.66)	0.0020***	(6.20)	0.00057***	(2.72)
Age <sub>it</sub>	-0.0081***	(-4.79)	-0.013***	(-4.02)	-0.014***	(-3.99)	-0.0039*	(-1.71)
Beta <sub>it</sub>	-0.00068	(-0.24)	-0.019***	(-3.82)	-0.015***	(-2.92)	-0.0062	(-1.39)
Lev <sub>it</sub>	0.0001***	(2.98)	-0.000075	(-0.89)	-0.000052	(-0.61)	0.000027	(0.45)
I_Own <sub>it</sub>	-0.000190**	(-2.17)	-0.001***	(-6.81)	-0.0012***	(-6.67)	-0.00008	(-0.65)
P_Own <sub>it</sub>	-0.000075	(-1.28)	-0.001***	(-2.92)	-0.0004***	(-3.01)	0.000005	(0.06)
Macro Controls	Yes		Yes		Yes		Yes	
Lag AEM	Yes		Yes		Yes		Yes	
Industry Effects	Yes		Yes		Yes		Yes	
Year Effects#	Yes		Yes		Yes		Yes	
N	9582		9540		9540		8140	
R-sq.	0.107		0.154		0.136		0.081	

**Panel (B).** Implication of Financial Crisis

	ABAC <sub>MJ</sub>		ABAC <sub>ROA</sub>		ABAC <sub>LGROA</sub>		ABAC <sub>PM</sub>	
Sent <sub>t-1</sub>	0.0299***	(3.05)	0.0698***	(3.54)	0.0598***	(2.96)	0.0468***	(2.98)
Sent*	-0.002	(-1.18)	-0.0143***	(-4.18)	-0.015***	(-4.20)	-0.0117***	(-4.37)
GFCDummy	-0.0352**	(-2.03)	-0.0910***	(-2.62)	-0.072**	(-2.01)	-0.0752***	(-2.77)
Size <sub>it</sub>	-0.0057***	(-10.78)	-0.0002	(-0.19)	-0.0008	(-0.76)	-0.005***	(-6.12)
MB <sub>it</sub>	0.0014***	(5.23)	0.0018***	(3.47)	0.00096*	(1.81)	0.0018***	(4.36)
ROA <sub>it</sub>	0.00045***	(4.33)	0.0020***	(9.71)	0.0017***	(8.11)	0.00049***	(3.06)
Age <sub>it</sub>	-0.0089***	(-7.06)	-0.015***	(-5.83)	-0.015***	(-5.74)	-0.0078***	(-4.21)
Beta <sub>it</sub>	0.00244	(1.19)	-0.0152***	(-3.68)	-0.0099**	(-2.34)	0.0023	(0.73)
Lev <sub>it</sub>	0.00011***	(2.76)	-0.000037	(-0.45)	-0.0000001	(-0.01)	0.000083	(1.30)
I_Own <sub>it</sub>	-0.00206**	(-2.79)	-0.00178**	(-2.26)	-0.00185**	(-2.61)	-0.00396***	(-5.90)
P_Own <sub>it</sub>	-0.0000189	(-1.56)	-0.000149	(-1.41)	-0.0000192	(-1.56)	-0.0000121	(-0.82)
Macro Controls	Yes		Yes		Yes		Yes	
Lag AEM	Yes		Yes		Yes		Yes	
Industry Effects	Yes		Yes		Yes		Yes	
N@	9582		9540		9540		8140	
R-sq.	0.084		0.105		0.094		0.044	

**Notes:** This table reports the estimation results for equation (7) for the four unsigned AEM proxies (ABAC<sub>MJ</sub>, ABAC<sub>ROA</sub>, ABAC<sub>LGROA</sub>, and ABAC<sub>PM</sub>) as dependent variables. Sent is the annual sentiment index. The Regulatory Quality (RQ) variable is from the Worldwide Governance Indicators published by World Bank. Global financial crisis (GFCDummy) is a dummy variable (post-crisis period as one otherwise zero). Audit quality is measured as a dichotomous variable whether the firm has been audited by the Big four (Big4) auditors. Variable description is same as in Appendix 1. Sample period is from 2000-2017. t statistics are in parenthesis. \*, \*\*, \*\*\* indicates statistical significance at 10%, 5%, and 1% respectively.

**Table 11.** Sentiment and Earnings Management: Effect of Corporate Governance**Panel (A).** Board Size (CG1\_Bsize)

Coefficients	ABAC <sub>MJ</sub>		ABAC <sub>ROA</sub>		ABAC <sub>LGROA</sub>		ABAC <sub>PM</sub>	
Sent <sub>t-1</sub>	0.669	(1.25)	4.507***	(4.29)	4.492***	(4.19)	2.578***	(3.22)
Sent <sub>t-1</sub> * CG1_Bsize <sub>t</sub>	0.0029	(0.17)	0.0018	(0.05)	0.00011	(0.01)	-0.0025	(-0.09)
CG1_Bsize <sub>t</sub>	-0.0018	(-1.08)	-0.0095***	(-2.79)	-0.011***	(-3.26)	-0.00114	(-0.45)
Controls	Yes		Yes		Yes		Yes	
Year Effects#	Yes		Yes		Yes		Yes	
Industry Effects	Yes		Yes		Yes		Yes	
N	9582		9540		9540		8140	
R-sq.	0.111		0.166		0.147		0.092	

**Panel (B).** Board Independence (CG2\_Bindip)

Coefficients	ABAC <sub>MJ</sub>		ABAC <sub>ROA</sub>		ABAC <sub>LGROA</sub>		ABAC <sub>PM</sub>	
Sent <sub>t-1</sub>	0.733	(1.38)	4.448***	(4.20)	4.349***	(4.06)	2.602***	(3.23)
Sent <sub>t-1</sub> * CG2_Bindip <sub>t</sub>	0.0228	(1.09)	0.0749*	(1.84)	0.0779*	(1.87)	0.0048	(0.15)
CG2_Bindip <sub>t</sub>	0.00143	(0.85)	0.00026	(0.08)	-0.00074	(-0.22)	0.00156	(0.62)
Controls	Yes		Yes		Yes		Yes	
Year Effects#	Yes		Yes		Yes		Yes	
Industry Effects	Yes		Yes		Yes		Yes	
N	9582		9540		9540		8140	
R-sq.	0.111		0.165		0.146		0.092	

**Panel (C).** Board Meetings (CG3\_Bmeet)

Coefficients	ABAC <sub>MJ</sub>		ABAC <sub>ROA</sub>		ABAC <sub>LGROA</sub>		ABAC <sub>PM</sub>	
Sent <sub>t-1</sub>	0.175	(0.33)	3.787***	(3.60)	3.643***	(3.39)	2.140***	(2.65)
Sent <sub>t-1</sub> * CG3_Bmeet <sub>t</sub>	-0.0520***	(-2.63)	-0.0503	(-1.25)	-0.0703*	(-1.69)	-0.0505*	(-1.65)
CG3_Bmeet <sub>t</sub>	0.0079***	(-4.72)	-0.0075**	(-2.18)	-0.0076**	(-2.09)	-0.0065**	(-2.49)
Controls	Yes		Yes		Yes		Yes	
Year Effects#	Yes		Yes		Yes		Yes	
Industry Effects	Yes		Yes		Yes		Yes	
N	9582		9540		9540		8140	
R-sq.	0.114		0.166		0.146		0.093	

**Panel (D).** Board Attendance (CG4\_BAttend)

Coefficients	ABAC <sub>MJ</sub>		ABAC <sub>ROA</sub>		ABAC <sub>LGROA</sub>		ABAC <sub>PM</sub>	
Sent <sub>t-1</sub>	0.610	(1.13)	4.077***	(3.89)	3.904***	(3.66)	2.588***	(3.16)
Sent <sub>t-1</sub> * CG4_BAttend <sub>t</sub>	0.00928	(0.45)	-0.0214	(-0.53)	-0.0360	(-0.85)	0.0384	(1.22)
CG4_BAttend <sub>t</sub>	-0.00152	(-0.91)	-0.00193	(-0.60)	-0.0033	(-0.98)	-0.0034	(-1.37)
Controls	Yes		Yes		Yes		Yes	
Year Effects#	Yes		Yes		Yes		Yes	
Industry Effects	Yes		Yes		Yes		Yes	
N	9582		9540		9540		8140	
R-sq.	0.111		0.165		0.146		0.093	

**Table 11.** Continued  
**Panel (E).** Board Level Governance Index (CG5\_CGIndex)

Coefficients	ABAC <sub>MJ</sub>		ABAC <sub>ROA</sub>		ABAC <sub>LGROA</sub>		ABAC <sub>PM</sub>	
Sent <sub>t-1</sub>	0.397	(0.74)	3.879***	(3.68)	3.647***	(3.41)	2.322***	(2.84)
Sent <sub>t-1</sub> *	-0.0051	(-0.48)	0.00122	(0.06)	-0.00801	(-0.37)	-0.00401	(-0.25)
CG5_CGIndex <sub>t</sub>								
CG5_CGIndex <sub>t</sub>	-0.003***	(-3.12)	-0.005***	(-2.99)	-0.007***	(-3.50)	-0.003**	(-2.07)
Controls	Yes		Yes		Yes		Yes	
Year Effects#	Yes		Yes		Yes		Yes	
Industry Effects	Yes		Yes		Yes		Yes	
N	9582		9540		9540		8140	
R-sq.	0.112		0.166		0.147		0.093	

**Notes:** This table reports the estimation results for equation (8) for the four unsigned AEM proxies (ABAC<sub>MJ</sub>, ABAC<sub>ROA</sub>, ABAC<sub>LGROA</sub>, and ABAC<sub>PM</sub>) as dependent variables. Sent is the annual sentiment index. Variable description is same as in Table 1. Standard errors are two-way cluster-robust (Petersen, 2009). #In our unreported results we also estimate equation (8) without year fixed effect, and our results are qualitatively similar. \*, \*\*, \*\*\* indicates statistical significance at 10%, 5%, and 1% respectively.

signed (upward and downward) AEM measures<sup>20</sup>.

## MEETING OR BEATING ANALYSTS' FORECASTS

Existing literature highlights that managerial motives for engaging at higher earnings management could be driven by incentives to meet or beat analysts' earnings forecasts (Burgstahler and Dichev, 1997; Degeorge et al., 1999; Simpson, 2013). Moreover, to avoid negative earnings, surprises managers may try to impede accurate financial figures value relevance by increasing accruals (Marquardt and Wiedman, 2004). Therefore, it is reasonable to expect that the likelihood of meeting or beating analysts' forecasts via upward earnings management (positive abnormal accruals) will be high following a high sentiment period if earnings management is at least partly in response to analyst optimism. We test this hypothesis by considering three types of Bloomberg analyst estimates, i.e., sales estimates, income estimates, and earnings per share (EPS) estimates. For brevity, we use the performance-matched earnings management measure (ABAC<sub>PM</sub>) to examine the implication of meeting or beating analysts' forecasts. We replace the dependent variable in equation (5), AEM, with an indicator variable, ABAC<sub>PM</sub>, equal to one if abnormal accruals are positive and 0 otherwise. While estimating the logit regressions, we condition the probability of ABAC<sub>PM</sub> = 1 on firms' having met or exceeded analysts' expectations (MEETBEAT, i.e., an indicator variable set to one if the company meets or exceeds its latest Bloomberg analyst consensus). We incorporate our standard firm-specific and macro-economic controls in our estimation. We also estimate the model by controlling the effect of CG5\_CGIndex and its interaction with the lag sentiment variable. Our results are from a logit regression of Prob (ABAC<sub>PM</sub> | MEETBEAT = 1), reported in Panel (A) and Panel (B) of Table 13. Estimation results in Table 13 suggest that managers' propensity to increase abnormal accruals is more pronounced when the market-wide sentiment is optimistic about meeting or exceeding analyst forecasts. Our results are consistent across all three analyst estimates (sales, income, and EPS), control for governance, and control for the past AEM measure. Our results are consistent with the notion that positive earnings announcement news during optimistic sentiment periods can have a positive effect on the stock prices and thus, managers' report earnings upward to avoid negative earnings surprises (Burgstahler and Dichev, 1997; Degeorge et al., 1999; Simpson, 2013).

<sup>20</sup> In our unreported results, we have also examined the moderating effect of regulatory change ( $DCompAct_t$ ), and regulatory quality ( $RQ_{t-1}$ ), on income-increasing (upward) and income-decreasing (downward) AEM and our results are qualitatively similar to the firm-level governance controls.

**Table 12.** Sentiment Effect on Signed Abnormal Accruals: Role of Firm-Level Governance  
**Panel (A).** Board Size (CG1\_Bsize)

Variables	Upward Accrual Earnings Management				Downward Accrual Earnings Management			
	ABAC <sub>MJ</sub>	ABAC <sub>ROA</sub>	ABAC <sub>LGROA</sub>	ABAC <sub>PM</sub>	ABAC <sub>MJ</sub>	ABAC <sub>ROA</sub>	ABAC <sub>LGROA</sub>	ABAC <sub>PM</sub>
Sent <sub>t-1</sub>	0.49 (0.51)	4.13** (2.38)	3.691** (2.03)	3.545** (2.43)	-0.410 (-0.42)	-5.32*** (-2.82)	-6.49*** (-3.28)	-4.42*** (-2.63)
CG1_Bsize <sub>t</sub>	-0.003 (-0.81)	0.003 (0.38)	-0.001 (-0.20)	0.002 (0.34)	0.0036 (1.17)	0.017*** (3.37)	0.019*** (3.54)	0.0028 (0.56)
Sent <sub>t-1</sub> * CG1_Bsize <sub>t</sub>	0.0117 (0.37)	-0.0511 (-0.71)	-0.0619 (-0.82)	-0.0229 (-0.45)	0.0291 (0.97)	-0.0418 (-0.77)	-0.0289 (-0.49)	-0.0179 (-0.33)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	2947	1610	1734	2094	2380	3923	3671	2161
R-square	0.122	0.143	0.136	0.106	0.156	0.233	0.217	0.119

**Panel (B).** Board Independence (CG2\_Bindip)

Variables	Upward Accrual Earnings Management				Downward Accrual Earnings Management			
	ABAC <sub>MJ</sub>	ABAC <sub>ROA</sub>	ABAC <sub>LGROA</sub>	ABAC <sub>PM</sub>	ABAC <sub>MJ</sub>	ABAC <sub>ROA</sub>	ABAC <sub>LGROA</sub>	ABAC <sub>PM</sub>
Sent <sub>t-1</sub>	0.529 (0.55)	4.236** (2.42)	3.184* (1.72)	3.545** (2.43)	-0.348 (-0.35)	-4.88*** (-2.60)	-5.88*** (-3.01)	-4.51*** (-2.73)
CG2_Bindip <sub>t</sub>	-0.0003 (-0.09)	0.0049 (0.75)	-0.0028 (-0.43)	0.0013 (0.27)	0.0017 (0.53)	0.0098* (1.80)	0.0042 (0.76)	0.0002 (0.04)
Sent <sub>t-1</sub> * CG2_Bindip <sub>t</sub>	0.0277 (0.68)	0.00515 (0.06)	-0.0914 (-1.03)	0.0127 (0.20)	-0.079** (-2.09)	-0.0996 (-1.61)	-0.078 (-1.23)	-0.049 (-0.76)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	2947	1610	1734	2094	2380	3923	3671	2161
R-square	0.122	0.143	0.136	0.106	0.158	0.232	0.214	0.119

**Panel (C).** Board Meetings (CG3\_Bmeet)

Variables	Upward Accrual Earnings Management				Downward Accrual Earnings Management			
	ABAC <sub>MJ</sub>	ABAC <sub>ROA</sub>	ABAC <sub>LGROA</sub>	ABAC <sub>PM</sub>	ABAC <sub>MJ</sub>	ABAC <sub>ROA</sub>	ABAC <sub>LGROA</sub>	ABAC <sub>PM</sub>
Sent <sub>t-1</sub>	-0.224 (-0.23)	3.336* (1.88)	2.570 (1.37)	3.279** (2.22)	-0.18 (-0.18)	-4.44** (-2.37)	-5.38*** (-2.74)	-4.29*** (-2.59)
CG3_Bmeet <sub>t</sub>	-0.01*** (-4.26)	-0.0085 (-1.32)	-0.0118* (-1.92)	-0.0068 (-1.39)	0.003 (0.85)	0.008 (1.41)	0.004 (0.64)	-0.007 (-1.40)
Sent <sub>t-1</sub> * CG3_Bmeet <sub>t</sub>	-0.079** (-2.05)	-0.127 (-1.49)	-0.171* (-1.94)	-0.005 (-0.08)	-0.012 (-0.33)	0.033 (0.53)	0.079 (1.17)	0.048 (0.79)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	2947	1610	1734	2094	2380	3923	3671	2161
R-square	0.128	0.144	0.139	0.106	0.156	0.230	0.214	0.121

**Panel (D).** Board Attendance (CG4\_BAttend)

Variables	Upward Accrual Earnings Management				Downward Accrual Earnings Management			
	ABAC <sub>MJ</sub>	ABAC <sub>ROA</sub>	ABAC <sub>LGROA</sub>	ABAC <sub>PM</sub>	ABAC <sub>MJ</sub>	ABAC <sub>ROA</sub>	ABAC <sub>LGROA</sub>	ABAC <sub>PM</sub>
Sent <sub>t-1</sub>	0.67 (0.69)	4.67*** (2.62)	4.07** (2.19)	3.72** (2.50)	-0.035 (-0.03)	-4.27** (-2.26)	-5.34*** (-2.72)	-4.94*** (-2.95)
CG4_BAttend <sub>t</sub>	0.0027 (0.91)	0.0077 (1.11)	0.0036 (0.51)	-0.0007 (-0.14)	0.0039 (1.24)	0.0023 (0.45)	0.0027 (0.50)	-0.0009 (-0.19)
Sent <sub>t-1</sub> * CG4_BAttend <sub>t</sub>	0.033 (0.82)	0.096 (1.12)	0.095 (1.01)	0.058 (0.94)	0.027 (0.70)	0.11 (1.67)	0.099 (1.45)	-0.14** (-2.18)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	2947	1610	1734	2094	2380	3923	3671	2161
R-square	0.122	0.144	0.136	0.106	0.156	0.231	0.214	0.122

**Table 12.** Continued  
**Panel (E).** Board Level Governance Index (CG5\_CGIndex)

Variables	Upward Accrual Earnings Management				Downward Accrual Earnings Management			
	ABAC <sub>MJ</sub>	ABAC <sub>ROA</sub>	ABAC <sub>LGROA</sub>	ABAC <sub>PM</sub>	ABAC <sub>MJ</sub>	ABAC <sub>ROA</sub>	ABAC <sub>LGROA</sub>	ABAC <sub>PM</sub>
<b>Sent<sub>t-1</sub></b>	0.14 (0.15)	4.02** (2.25)	2.54 (1.32)	3.49** (2.36)	-0.044 (-0.04)	-4.42** (-2.34)	-5.27*** (-2.70)	-4.77*** (-2.87)
<b>CG5_CGIndex<sub>t</sub></b>	-0.004** (-2.20)	0.002 (0.56)	-0.005 (-1.24)	-0.001 (-0.54)	0.0034** (2.09)	0.011*** (3.57)	0.0084*** (2.63)	-0.0015 (-0.59)
<b>Sent<sub>t-1</sub> * CG5_CGIndex<sub>t</sub></b>	-0.002 (-0.11)	-0.026 (-0.64)	-0.079* (-1.76)	0.007 (0.24)	-0.006 (-0.27)	-0.003 (-0.10)	0.016 (0.44)	-0.044 (-1.44)
<b>Controls</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>N</b>	2947	1610	1734	2094	2380	3923	3671	2161
<b>R-square</b>	0.123	0.143	0.137	0.106	0.157	0.233	0.215	0.120
<b>Year Effects#</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Industry Effects</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

**Notes:** This table presents the regression results of equation (7) for the four signed (positive and negative) accrual earnings management proxies (ABAC<sub>MJ</sub>, ABAC<sub>ROA</sub>, ABAC<sub>LGROA</sub>, and ABAC<sub>PM</sub>) incorporating their sign, i.e., positive (income increasing) and negative (income decreasing). Panel (A) and Panel (B) presents the upward and downward abnormal accruals. *Sent* is the annual sentiment index. Variable description is same as in Appendix 1. #In our unreported results we also estimate equation (7) without year fixed effect, and our results are qualitatively similar. Sample period is from 2000-2017. *t* statistics are in parenthesis. Standard errors are two-way cluster-robust (Petersen, 2009). \*, \*\*, \*\*\* indicates statistical significance at 10%, 5%, and 1% respectively.

## EFFECT OF AUDIT QUALITY

Existing research highlights that audit quality, and the role of external auditors reserve a critical criterion to verify the financial statement and quality of accounting reporting that reflects the entity's authentic operating results (Lin and Hwang, 2010). For instance, Becker et al. (1998) highlight that lower audit quality is associated with more accounting flexibility. Thus, managerial motives for earnings management will be higher in a low audit quality environment. In one of the recent works, Commerford et al. (2016) document that auditors are less likely to retain a client who engages in earnings manipulation and more likely to report such instances to the audit committee. These findings suggest that external auditors are more likely to curb earnings management. We measure the audit quality as a dichotomous variable whether the firm has been audited by the Big four (Big4) auditors and assume that Big Four (Big4) auditors are of higher quality than non-Big Four auditors. We have estimated the equation (6) to examine the Big4 moderating effect on the sentiment and AEM relationship.

Consistent with our previous results, we observe a positive and significant effect of *Sent<sub>t-1</sub>* on our AEM measures. In Table 14 our results indicate that in the presence of Big4 there is a decline in the propensity for earnings management measured by ABAC<sub>MJ</sub> (coeff. = -0.0034, *t* = -1.86), ABAC<sub>ROA</sub> (coeff. = -0.0072, *t* = -1.90), ABAC<sub>LGROA</sub> (coeff. = -0.0069, *t* = -1.79). Our results support the findings of existing literature which documents those auditors play an important role in curbing accrual-based earnings management (Becker et al., 1998; Commerford et al., 2016; Lin and Hwang, 2010). However, our interaction variable, i.e., *Sent<sub>t-1</sub>\*Big4<sub>it</sub>* remains insignificant across all the AEM measures. Overall, our results suggest that although better audit quality helps to curb earnings management practices, they are insufficient to minimize managerial opportunistic motives following a favourable sentiment environment in the market.



**Table 13.** Meeting or Beating Analysts' Forecasts and Investor Sentiment  
**Panel (A).** Probabilities of Positive ABAC<sub>PM</sub> Accruals Conditional on Analysts' Forecasts

Analyst Estimates Variables	Sales Estimates		Income Estimates		EPS Estimates	
	(1)	(2)	(1)	(2)	(1)	(2)
Sent <sub>t-1</sub>	2.784*	2.498*	3.114**	2.762*	3.365**	3.092**
	(1.87)	(1.69)	(2.15)	(1.92)	(2.33)	(2.16)
ABAC <sub>PM t-1</sub>		0.394***		0.404***		0.396***
		(5.47)		(5.49)		(5.31)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year Effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry Effects	Yes	Yes	Yes	Yes	Yes	Yes
N	4366	4366	4239	4239	4209	4209

**Panel (B).** Probabilities of Positive ABAC<sub>PM</sub> Accruals Conditional on Analysts' Forecasts: The Effects of Governance

Analyst Estimates Variables	Sales Estimates		Income Estimates		EPS Estimates	
	(1)	(2)	(1)	(2)	(1)	(2)
Sent <sub>t-1</sub>	3.292**	3.017*	3.538**	3.201**	3.842**	3.588**
	(2.11)	(1.94)	(2.32)	(2.11)	(2.53)	(2.38)
CG_Index <sub>t</sub>	0.057	0.060*	0.040	0.044	0.046	0.050
	(1.45)	(1.68)	(1.01)	(1.15)	(1.16)	(1.30)
Sent <sub>t-1</sub> * CG_Index <sub>t</sub>	-0.090	-0.067	-0.159	-0.138	-0.158	-0.147
	(-0.23)	(-0.18)	(-0.40)	(-0.35)	(-0.40)	(-0.37)
ABAC <sub>PM t-1</sub>		0.396***		0.405***		0.397***
		(5.48)		(5.50)		(5.32)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year Effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry Effects	Yes	Yes	Yes	Yes	Yes	Yes
N	4366	4366	4239	4239	4209	4209

**Notes:** This table reports logit regression of Prob (ABAC<sub>PM</sub> | MEETBEAT = 1) for the performance-matched earnings management measure (ABAC<sub>PM</sub>) to examine the implication of meeting or beating analysts' forecasts. Our fixed effects logistic regression logistic regression model specification in Panel (A) and (B) is like the equation (7) and (8), respectively with Prob (ABAC<sub>PM</sub> | MEETBEAT = 1) as dependent variable. We use Bloomberg analysts estimates for sale, income, and EPS. CG5\_CGIndex is a composite governance index. *t* statistics are in parenthesis. Variable description is same as in Appendix 1. \*, \*\*, \*\*\* indicates statistical significance at 10%, 5%, and 1% respectively.

## SUMMARY AND CONCLUSION

This paper investigates investor sentiment and managerial motives for accrual earnings management from an emerging market perspective. Our results suggest that prevailing market-wide sentiment is having a significant positive effect on earnings management. The possibility of income-increasing (income-decreasing) earnings management is also positively (negatively) associated with investor sentiment. The impact of sentiment on earnings management is robust controlling macroeconomic variables, alternative sentiment proxies, institutional environment, corporate governance, ownership structure, and regulatory reform. Nevertheless, in the presence of better governance sentiment induced downward earnings management is more persistent than the strategic use of upward earnings management.

Overall, we find that better governance structure and improved regulatory environment matters for restricting sentiment induced earnings management motives. Results further confirm that improved governance characteristics like larger board, increased board independence, and stringent related party transaction norms help to monitor corporate behaviour and mitigates opportunistic earnings management activity of managers with an exogeneous effect of market sentiment. Our results reinforce existing findings, which suggest that a better firm-level governance structure minimizes opportunistic earnings management activities. Our results are consistent with a set of robustness tests concerning alternative sentiment proxies, financial crisis, meet or beat analyst estimates, and audit quality. Our findings also extend the emerging market literature by establishing that managers follow the prevailing sentiment environment in the market to accommodate financial reporting choices (Ali and Gurun, 2009; Bergman and Roychowdhury, 2008; Brown et al., 2012; Hribar and McInnis, 2012; Simpson, 2013). There is scope to extend our findings for the real earnings management, portfolio stock return implications, and cross-country analysis considering the cultural difference. These limitations of our present study are an opportunity to describe the need for future research.

**Table 14.** Sentiment and Earnings Management: Implication of Audit Quality

	ABAC <sub>MJ</sub>	ABAC <sub>ROA</sub>	ABAC <sub>LGROA</sub>	ABAC <sub>PM</sub>
<b>Sent<sub>t-1</sub></b>	0.660 (1.25)	4.318*** (4.18)	4.248*** (4.04)	2.532*** (3.17)
<b>Sent<sub>t-1</sub> * Big4<sub>it</sub></b>	0.016 (0.91)	0.023 (0.70)	-0.003 (-0.10)	0.039 (1.41)
<b>Big4<sub>it</sub></b>	-0.003* (-1.86)	-0.007* (-1.90)	-0.007* (-1.79)	0.0002 (0.06)
<b>Size<sub>it</sub></b>	-0.005*** (-4.62)	0.0027 (1.21)	0.0018 (0.83)	-0.004** (-2.33)
<b>MB<sub>it</sub></b>	0.002*** (3.19)	0.003*** (4.44)	0.003*** (3.06)	0.002*** (2.87)
<b>ROA<sub>it</sub></b>	0.0005*** (3.13)	0.002*** (7.19)	0.002*** (5.84)	0.0005*** (2.18)
<b>Age<sub>it</sub></b>	-0.008*** (-4.61)	-0.012*** (-3.68)	-0.013*** (-3.69)	-0.0033 (-1.44)
<b>Beta<sub>it</sub></b>	-0.0002 (-0.07)	-0.014*** (-2.62)	-0.0098* (-1.80)	-0.0041 (-0.87)
<b>Lev<sub>it</sub></b>	0.0001*** (2.62)	-0.0001 (-1.20)	-0.00008 (-0.88)	0.00002 (0.26)
<b>I_Own<sub>it</sub></b>	-0.0002** (-1.97)	-0.0012*** (-6.84)	-0.0012*** (-6.70)	-0.00011 (-0.87)
<b>P_Own<sub>it</sub></b>	-0.00006 (-1.04)	-0.0003** (-2.54)	-0.0003*** (-2.68)	0.00003 (0.37)
<b>Macro Controls</b>	Yes	Yes	Yes	Yes
<b>Lag AEM</b>	Yes	Yes	Yes	Yes
<b>Industry Effects</b>	Yes	Yes	Yes	Yes
<b>Year Effects#</b>	Yes	Yes	Yes	Yes
<b>N@</b>	9580	9538	9538	8138
<b>R-sq.</b>	0.112	0.166	0.146	0.092

**Notes:** This table reports the estimation results for equation (8) for the four unsigned AEM proxies (ABAC<sub>MJ</sub>, ABAC<sub>ROA</sub>, ABAC<sub>LGROA</sub>, and ABAC<sub>PM</sub>) as dependent variables. Sent is the annual sentiment index. Audit quality is measured as a dichotomous variable whether the firm has been audited by the Big four (Big4) auditors. Variable description is same as in Appendix 1. Sample period is from 2000-2017. t statistics are in parenthesis. \*, \*\*, \*\*\* indicates statistical significance at 10%, 5%, and 1% respectively.

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## APPENDIX

## DESCRIPTION OF VARIABLES

<b>Panel (A) Earnings Management Variables</b>	
<b>ABAC<sub>MJ</sub></b>	<i>Difference between the total accruals and accruals through modified Jones model.</i>
<b>ABAC<sub>ROA</sub></b>	<i>Difference between the total accruals and accruals through modified-Jones model with return on asset</i>
<b>ABAC<sub>LGROA</sub></b>	<i>Difference between the total accruals and accruals through modified-Jones model (lag return on asset)</i>
<b>ABAC<sub>PM</sub></b>	<i>Performance-matched discretionary accruals.</i>
<b>MEETBEAT</b>	<i>An indicator variable set to one if the company meets or exceeds its latest Bloomberg analyst consensus</i>
<b>Panel (B) Sentiment Variables</b>	
<b>Sent</b>	<i>Sentiment index constructed from market related sentiment proxies</i>
<b>ASent</b>	<i>Alternative sentiment index with simple average approach (Section 3.2.1)</i>
<b>Sent_Dummy</b>	<i>Indicator variable coded 1 for high sentiment period and zero otherwise</i>
<b>BCI</b>	<i>Business confidence index data from the OECD data library</i>
<b>IA</b>	<i>Google search volume index (GSVI) for the keyword “BSE Sensex”</i>
<b>Panel (C) Regulatory Environment Variables</b>	
<b>DCompAct</b>	<i>Dummy variable, 1 for the period 2013-17 (post regulation reform) and zero otherwise</i>
<b>DB_Size</b>	<i>Dummy variable, 1 if firm increases board size and zero if they do not change or decrease</i>
<b>DB_Ind</b>	<i>Dummy variable, 1 if firm increases proportion of independent directors and zero if they do not change or decrease</i>
<b>DPRT</b>	<i>Dummy variable for related party transactions</i>
<b>RQ</b>	<i>World Bank Worldwide Governance Indicators</i>
<b>GFCDummy</b>	<i>value one after the crisis period (2008-2017) and zeros otherwise.</i>
<b>Panel (D) Governance Variables</b>	
<b>CG1_Bsize</b>	<i>Natural log of number of directors in the board</i>
<b>CG2_Bindip</b>	<i>Percentage of independent directors in the board</i>
<b>CG3_Bmeett</b>	<i>Log of total meetings conducted by the firms</i>
<b>CG4_BAttendt</b>	<i>The average attendance of the board members</i>
<b>CG5_CGIndext</b>	<i>Composite corporate governance index</i>
<b>Big4</b>	<i>Dichotomous variable, one if audited by big four auditors or else zero</i>



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<b>Panel (E) Control Variables</b>	
<b>Size</b>	<i>Natural log of net sales</i>
<b>MB</b>	<i>The market-to-book ratio</i>
<b>ROA</b>	<i>Ratio of profit before interest and tax to total assets</i>
<b>Age</b>	<i>Natural log of number of years since the incorporation</i>
<b>Beta</b>	<i>Market beta of the firm <math>i</math> in the year <math>t</math> using CAPM</i>
<b>Lev</b>	<i>Ratio of debt to equity</i>
<b>I_Own<sub>t</sub></b>	<i>Percentage of shareholding by institutional investors</i>
<b>P_Own</b>	<i>Percentage of shareholding by promoters</i>
<b>TS</b>	<i>Term Spread, i.e., yield difference between Government of India long-term (10 year) and short-term (91-days) bonds.</i>
<b>INF</b>	<i>Inflation measured through the consumer price index</i>
<b>MR</b>	<i>Annual BSE Sensex return</i>

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