EARNINGS MANAGEMENT, INSTITUTIONAL SHAREHOLDING AND IDIOSYNCRATIC VOLATILITY: EVIDENCE FROM INDIA

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Abstract

Existing research provide mixed evidence on the relationship between earnings management and idiosyncratic volatility. However, the effect of institutional shareholding on this relationship has not been investigated. We investigate the relationship between earnings management and idiosyncratic volatility and the effect of institutional shareholding on this relationship. Using 2SLS regression, our results suggest a positive relationship between earnings management and idiosyncratic volatility. The results, however, do not suggest that institutional shareholding has a significant effect on the relationship between earnings management and idiosyncratic volatility. The results are robust to different methods of estimating earnings management and idiosyncratic volatility.

***Keywords*:** Idiosyncratic Volatility, Earnings Management, Institutional Ownership, 2SLS Regression

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1 Introduction

Conventional asset pricing theory and models suggest that only systematic risk should be priced as investors can diversify the unsystematic risk. However, when the investors are undiversified, firm specific risk or idiosyncratic risk becomes an important aspect of total returns. In such situations, it is important to understand the behavior and sources of idiosyncratic risk. In a seminal study on this issue, Campbell et al. (2001) argue that "aggregate market return is only one component of the return to an individual stock" and it is important to understand the other component that is industry level and idiosyncratic firm- level shocks. The study finds a temporal increase in idiosyncratic volatility since 1962 in the U.S. stock markets. Brandt et al. (2010) and Fink et al. (2010) document decline in idiosyncratic volatility from 2001 to 2006. Morck et al. (2000) finds that relative idiosyncratic risk (proportion of idiosyncratic risk to systematic risk) has decreased over time in U.S.

Understanding of idiosyncratic volatility and its sources is important for portfolio diversification issues, arbitrage under mispricing of individual stocks as well as pricing of an option on an individual stock. Since the study of Campbell et al. (2001), understanding the sources of idiosyncratic stock return volatility has emerged as one of the important areas of research in finance and economics.

Further, number of studies has attempted to explain the sources of rise and decline in idiosyncratic volatility. Brandt et al.(2010) document that such rise and fall is due to trading of low priced stocks by retail investors. Zhang (2010) on the other hand argues that such changes can be explained by the fundamentals, current earnings, and growth in future earnings. Ferreira and Laux (2007) investigate the relationship between relative idiosyncratic volatility and corporate governance and show that corporate governance related to anti-takeover provisions is negatively related to relative idiosyncratic risk. Further, they document that trading by institutions strengthens the negative relationship between idiosyncratic volatility and anti-takeover provisions.

However, only few studies have documented the relationship between earnings management and idiosyncratic volatility. Rajgopal and Venkatachalam (2011) investigate the relationship between earnings quality and stock return volatility and show that deteriorating earnings quality is associated with higher stock return volatility. Cheng et al. (2012) investigate the relationship between variance in idiosyncratic volatility and discretionary accrual volatility and document a positive relationship between the two. These studies have been carried out on the U.S. and other developed markets. Not many studies on the association of earnings management and idiosyncratic volatility are available with respect

to emerging economies with special reference to Indian context. It is important to understand the nature of these associations in context of an emerging economy like India as studies (e.g. Jian and Wong, 2003 and Leuz et al., 2003) have found that practices of earnings management are more pervasive in emerging economies than in developed economies owing to weak legal enforcement system. Therefore, we propose this study in Indian context.

Prior studies have documented a positive association between institutional ownership and idiosyncratic volatility (e.g. Xu and Malkeil, 2003; Dennis and Strickland, 2009) and have provided mixed evidence on relationships between earnings management and institutional ownership (e.g. Bushee, 1998; Chung et al.,2002; Burgsthaler and Dichev, 1997; Barth et al., 1999; Koh, 2003). However, we are not aware of any study that has analyzed the effect of institutional shareholding on the relationship between earnings management and idiosyncratic volatility.

The objectives of this paper are two-fold. First is to empirically analyze the relationship between earnings management and idiosyncratic volatility in Indian context. Second is to understand how institutional shareholding in a firm affects the relationship between earnings management and idiosyncratic volatility.

To achieve these objectives, we analyze the relationship between idiosyncratic volatility and accrual based earnings management (inverse of financial reporting quality). The earnings management measures we consider is absolute value of discretionary accruals (DA) estimated using Kothari et al. (2005) model and tested for robustness using Jones (1991) model and Modified Jones (Dechow et al. 2005) model. These models assume that fundamental shifts in operating activities such as revenue, fixed assets and past performance determine the accruals and any deviations from such fundamentals are due to managerial discretion. Idiosyncratic volatility is measured by taking the annualized variance of residual of the market model. For robustness purposes, we also consider the annualized variance of the residual of the Fama and French (1992) three-factor model.

We also investigate the effect of institutional shareholding on the relationship between earnings management and idiosyncratic volatility. The conjecture is that institutional shareholders may exert significant influence on the decision making process in a firm as well as the managerial discretion. This influence may lead to higher or lower levels of earnings management, which can then affect the idiosyncratic volatility of the firm's stock. We expect a positive effect of institutional shareholding on the relationship between earnings management and idiosyncratic volatility. We test for this effect firstly by considering overall institutional shareholding in the firm and secondly by considering only the shareholding of non-promoter institutional shareholder. Our methodology here is motivated by the prior research (see Burgsthaler and Dichev, 1997; Barth et al., 1999; Koh, 2003; Hsu and Koh, 2005) that suggest that short term or transient shareholder, due to their myopic view, may encourage the practices of earnings management.

As pointed out by earlier studies (e.g. Rajgopal and Venkatachalam, 2008) endogenity may be a concern in studies such as ours. Following Mishra and Modi (2013) we actively control the problem of endogenity by using 2SLS regression. Using 2SLS we are able to specify earnings management as an endogenous variable explained by lagged values of idiosyncratic volatility and various corporate governance factors. The utilization of 2SLS allows us to generate statistically robust findings.

Using a sample of 2,221 firm years from the financial year 2005-06 to 2012-13, we document a significantly positive relationship between earnings management and idiosyncratic volatility. These results are consistent with the theory that worsening earnings quality causes noisier earnings (Easley and O'Hara (2004) and O'hara (2003)).

With regard to institutional shareholding, our results suggest a positive but insignificant (at 5% significance level) effect of institutional shareholding on the relationship between earnings management and idiosyncratic volatility. The results are similar whether we use overall institutional shareholding or only non-promoter institutional shareholding. These results therefore indicate that idiosyncratic volatility is affected more by trading by unsophisticated traders rather than institutional trading. These results are consistent with Harris (2003) who argues that "transitory volatility is due to trading activity by uninformed traders".

The rest of the paper is organized as follows. Section 2 reviews the related literature and describes the hypotheses. Section 3 provides the research methodology, sample data and variables. Section 4 discusses the results and Section 5 concludes the paper.

2 Literature review and hypothesis development

Accounting research provides mixed evidences on informativeness of accounting information. On one hand Lev and Zarowin (1999) argue that relevance of accounting information for stock markets has declined and on the other hand Francis and Schipper (1999) and Landsman and Maydew (2002) demonstrate that relevance of financial statements has not decreased over time. Sloan 1996 shows that firms with low accruals earn significantly higher abnormal returns than firms with high accruals. Bradshaw et. al (2001) and Richardson (2003) provide further evidence to this effect. Healy, Hutton and Palepu (1999) argue

that improved financial disclosures reduces the information asymmetries and thereby reduces the volatility in stock returns. Similarly, Easley and O'Hara (2004) and O'hara (2003) argue that worsening earnings quality causes noisier earnings and thus influence the information risk and the idiosyncratic volatility of the firm. Leuz and Verrechia (2000) finds that improvement in the financial disclosure (proxied by shift from German GAAPs to IAS) results into decline in information asymmetries proxied by bid and ask spread.

Rajgopal and Venkatachalam (2011) posit a positive relationship between deteriorating earnings quality and idiosyncratic volatility over time. They take a sample of firms listed on NYSE, AMEX, NASDAQ spanning from 1962 to 2001 and show that idiosyncratic volatility is positively related to interaction of time and worsening earnings quality.

Cheng et al. (2012) hypothesize that poor information quality underlying managerial discretion induces high idiosyncratic volatility. They decompose earnings volatility into pre-managed earnings volatility (PMEV), discretionary accrual volatility (DAV) and correlation between pre-managed earnings and discretionary accruals ($\rho_{PME,DA}$). They argue that DAV and $\rho_{PME,DA}$ measure the multi-period managerial discretion in accruals. Their results, based on the sample of firms listed on stock exchanges in US, show that idiosyncratic volatility is associated with PMEV, DAV and $\rho_{PME,DA.}$

Our hypothesis is related to the mixed evidence on market transparency, market efficiency, and stock return synchronicity. Morck et al. (2000) argues that there is negative relation between market synchronicity (proxied by R^2) and firm's information environment transparency such that higher transparency leads to lower R^2 as more firm-specific is incorporated in stock prices. On the other hand Dasgupta et al. (2010) argues that in efficient markets the more transparent is the firm environment, the more information of future earnings gets absorbed in stock prices and there are less shocks when the firm-specific event actually occurs. This leads to a higher R^2 or market synchronicity. Consistent with the arguments of Dasgupta et al. (2010) and the results of Rajgopal and Venkatachalam (2011) and Cheng et al. (2012), we posit that higher idiosyncratic volatility (inverse measure of market synchronicity) is associated with higher earnings management (inverse measure of transparency). Specifically, our first hypothesis is as below:

H1: Earnings management is positively associated with idiosyncratic volatility.

Prior research have also documented positive association between Institutional ownership and idiosyncratic volatility. Xu and Malkeil (2003) investigate whether idiosyncratic volatility is affected by institutional sentiment and find a positive relationship between idiosyncratic volatility and institutional ownership. Dennis and Strickland (2009) also document the same relationship. In similar vein, Piotroski and Roulstone (2004) find a positive association between idiosyncratic volatility and institutional trading.

Prior literature also provides mixed evidence of the effect of institutional shareholding on earnings management. One school of thought suggest that due to involvement of institutional shareholders in governance of the firm and their active control over the managers, the manager's ability to manage earnings gets restricted. Mitra and Cready (2005) finds that influence of institutional investors improves the quality of governance in the firm and thereby reduces the manager's discretionary abilities to manage earnings. Bushee (1998) find that when institutional shareholding is high, managers are less likely to reduce the R&D expenditure to manage higher profits. Chung et al (2002) argue that because of influence and discipline that institutional shareholders exert on the management, the manager's ability to manage earnings gets restricted.

The other school of thought argues that due to dependence on capital invested by institutional shareholders, management comes under pressure to perform. This pressure from institutional shareholders incites the manager to manage the earnings aggressively. Burgsthaler and Dichev (1997) and Barth, Elliot and Finn (1999) suggest that managers manage the earnings of the firm due to pressure exercised by the institutional investors. Such pressure is higher more in case of short term institutional shareholders, sometimes called as transient institutional investors, who wish to book profits on their investment in short term. Bushee (2001) argues that these type of investors have focus on current earnings and are generally dominant. They exert less monitoring on the management of the firm. Koh (2003) investigates the relationship between institutional ownership and aggressive earnings management in Australian setting. The results suggest a negative association when institutional ownership is high and a positive relationship when institutional shareholding is low. Extending on the arguments put forth by Koh (2003), Hsu and Koh (2005) investigates the relationship between earnings management and short-term and long term institutional ownership. They find that short-term and long-term institutional ownership have opposite effects on earnings management. While long-term institutional ownership controls the practice of earnings management, short-term institutional ownership is positively associated with earnings management. Cheng and Reitenga (2009) investigates the effect of institutional blockholders and institutional non-blockholders on earnings management and find that institutional blockholders tends to have a conservative approach in the sense that they constrain income-increasing earnings management but not income-decreasing earnings management. Peasnell et al (2005), however,

do not find any significant relationship between institutional ownership and earnings management.

From the above discussion, it follows that there is a mixed evidence of the influence of institutional shareholders on management's discretion to manage earnings. They respond differently in different settings. Long-term institutional investors may attempt to constrain the practices of earnings management whereas short-term institutional shareholders because of their myopic view may encourage earnings management. The net effect of opposing forces of long-term and short-term institutional shareholders would impact the institutional investors sentiments and may lead to bulk trading. Further, institutional shareholders due to bulk trading in stocks can also influence the idiosyncratic volatility. Therefore, we posit that institutional shareholding would enhance the positive relationship between idiosyncratic volatility and earnings management. Specifically, our second hypothesis is as below:

H2: Institutional shareholding increases the effect of EM on IV.

3 Methodology, data and variables

3.1 Methodology

To test the first hypothesis, our base model is:

$$IV_{it} = \beta_0 + \beta_1 DA_{it-1} + \varepsilon_{it} \quad (1)$$

Where, IV_{it} is the idiosyncratic volatility for firm i in year t and DA_{it-1} is the discretionary accruals (proxy for earnings management) in year t-1. For the second hypothesis, we argue that institutional ownership increases the impact of earnings management on idiosyncratic volatility. Specifically, we posit that

$$\beta_1 = \alpha_0 + \alpha_1 IS_{it-1} + \psi_{it} \quad (2)$$

Substituting (2) into (1), we get,

$$IV_{it} = \lambda_0 + \lambda_1 DA_{it-1} + \lambda_2 DA_{it-1} * IS_{it-1} + \varepsilon_{it..} \quad (3)$$

In order to control for potential omitted variables that might effect the relationship between earnings management and idiosyncratic volatility, we include number of control variables:

$$IV_{it} = \lambda_0 + \lambda_1 DA_{it-1} + \lambda_2 DA_{it-1} * IS_{it-1} + \lambda_3 ROE_{it-1} + \lambda_4 Lev_{it-1} + \lambda_5 PBR_{it-1} + \lambda_6 Size_{it-1} + \lambda_7 Age_{it-1} + \varepsilon_{it} \quad (4)$$

Where, ROE_{it-1} is the lagged return on equity, LEV_{it-1} is the leverage in year t-1, PBR_{it-1} is the price to book ratio, $Size_{it-1}$ is the firm size and Age_{it-1} is the age

Prior studies (e.g. Rajgopal and Venkatachalam, 2011) have indicated that even after having large number of control variables to mitigate omitted variable bias, studies like this may have endogentiy issues. We actively control the problem of endogenity by following the approach used by Mishra and Modi (2013). We used the two-stage-least-squares (2SLS) procedure to examine the hypothesis. The use of 2SLS allows us to specify both idiosyncratic volatility and earnings management as endogenous variables, and thus provide robust statistical estimates. Specifically, we estimate the system of equations:

$$IV_{it} = \lambda_{IV0} + \lambda_{IV1} DA_{it-1} + \lambda_{IV2} DA_{it-1} * IS_{it-1} + \lambda_{IV3} ROE_{it-1} + \lambda_{IV4} Lev_{it-1} + \lambda_{IV5} PBR_{it-1} + \lambda_{IV6} Size_{it-1} + \lambda_{IV7} Age_{it-1} + \varepsilon_{it} \quad (5a)$$

$$DA_{it-1} = \lambda_{EM0} + \lambda_{EM1} IV_{it-1} + \lambda_{EM2} ROE_{it-1} + \lambda_{EM3} Lev_{it-1} + \lambda_{EM4} PBR_{it-1} + \lambda_{EM5} Size_{it-1} + \lambda_{EM6} Age_{it-1} + \varepsilon_{it} \quad (5b)$$

However, eq. 5a and 5b presents an under-identified model. In order to estimate the model, we require some more variables that are correlated with DA. The extant literature on relationship between earnings management and corporate governance provide that various corporate governance factors affect the levels of earnings management. With a sample of 282 firms, Xie et al (2003) finds that proportion of independent directors in the board is negatively related to the level of earnings management. Klein (2002), Beasley (1996) and Davidson et al. (2005) has documented similar results with larger number of control variables. However, Peasnell et al. (2005) and Bradbury et al. (2006) could not find any significant association between board independence and earnings management. With a sample of 500 Indian firms, Sarkar et al. (2008) also found that higher independence of the board does not lead to lower of level of discretionary accruals. Osma (2008) argues that independent directors are competent enough to ascertain and restrict earnings management practices. With a sample of 770 firm years, Jaggi et al (2009) argues that an independent board generally proves to be an effective monitor for earnings management practices. However, such monitoring reduces in case of family controlled firms. Considering the prior empirical findings, we include percentage of independent directors on the board of

the firm as one of instruments for earnings management in the second equation.

Xie et al. (2003) argue that when board meetings are rare, issues such as earnings management may not be on the priority list due to paucity of time. In such cases, the function of the board is reduced to a mere rubber stamp to sign off management plans. Further, Xie et al.(2003) finds a significant negative association between earnings management and number of board meetings. Further, it is essential to analyze that even if the board meets frequently, how many directors actually attend the board meeting. Sarkar et al.(2008) in a study of 500 manufacturing firms in India find that board diligence i.e. number of meetings attended by the independent directors has a significant negative association with earnings management. Considering this, we include percentage of board meetings attended by the directors as an instrumental variable for earnings management in second equation.

Prior literature also document relationships between earnings management and multiple directorships. Jiraporn, Kim and Davidson (2008) argue that multiple directorships reduce effective monitoring and thus cause reduction in shareholder's wealth. Using number of directorships as proxy of independent director's reputation, Shivdasani (1993) and Vafeas (1999) argue that independent directors with more directorships are better monitors. Another instrument for earnings management, therefore, is average number of directorships in other firms held by the board members.

As discussed earlier, institutional shareholding may also a have a significant association with earnings management and hence institutional ownership is also include as one of the instruments in the second equation.

Lastly, previous studies have found associations between external auditor and earnings management. The argument is that an independent external audit may restrain the practices of earnings management and thus should result into better quality of financial reporting and earnings. One of the important factors about external audit is the size of the auditor. Krishnan (2003) and Habib (2011) find that firms audited by big N auditors tend to have lower earnings management. The reasons include lower economic dependence on clients and their reputation. Cohen and Zarowin (2010) and Chi et al. (2011), however, find that firms that are audited by big N audit firms tend to have high real earnings management. Contrary to this, Zang (2012) does not find a any association between big N auditors and real earnings management. Considering the above literature, we include auditor size as another instrumental variable. This variable is a dummy variable that takes the value one if the auditor is a big 4 audit firm and zero otherwise.

Considering the above arguments, our final system of equations to test our hypotheses is as below:

$$IV_{it} = \lambda_{IV0} + \lambda_{IV1}DA_{it-1} + \lambda_{IV2}DA_{it-1}*IS_{it-1} + \lambda_{IV3}ROE_{it-1} + \lambda_{IV4}Lev_{it-1} + \lambda_{IV5}PBR_{it-1} + \lambda_{IV6}Size_{it-1} + \lambda_{IV7}Age_{it-1} + \varepsilon_{it} \quad (6a)$$

$$DA_{it-1} = \lambda_{EM0} + \lambda_{EM1}IV_{it-1} + \lambda_{EM3}IS_{it-1} + \lambda_{EM4}AudSize_{it-1} + \lambda_{EM5}PID_{it-1} + \lambda_{EM6}PBM_{it-1} + \lambda_{EM7}OCD_{it-1} + \lambda_{EM8}ROE_{it-1} + \lambda_{EM9}Lev_{it-1} + \lambda_{EM10}PBR_{it-1} + \lambda_{EM11}Size_{it-1} + \lambda_{EM12}Age_{it-1} + \varepsilon_{it} \quad (6b)$$

where, IS is the proportion of shares held by institutional shareholders, AudSize is a dummy variable that takes the value 1 if the firm is audited by a big 4 auditor else 0, PID is the proportion of independent directors in the board, PBM is the average percentage of board meetings attended by the directors, and OCD is the average outside directorships held.

3.2 Data

The data for this study is taken from Prowess Database created and managed by Center for Monitoring Indian Economy (CMIE). The Prowess database contains data related to stock prices of the Indian companies, financials, as well as corporate governance. The sample for this study spans from the financial year 2005-06 to 2012-13. We started with the initial set of 500 companies listed on National Stock Exchange of India and forming part of S&P CNX 500 index. S&P CNX 500 is a broad based index covering companies from 72 industries. From this, we have eliminated companies from financial services and utilities following the previous literature. For computing discretionary accruals, we require the industry corresponding to the sample company to have atleast 10 firms each year. We eliminated all such industries that had less than 10 firms in a year. Further we eliminated those firm-year observations for which data related to stock returns, financials or corporate governance was not available. The data was then winsorized at 1% to avoid outliers leaving the final data of 2221 firm year observations. The final sample is distributed as in Table 1.

3.3 Measurement of variables

Our objective is to study the effect of earnings management on idiosyncratic stock return volatility keeping corporate governance factors as the variables that may impact earnings management. Further, we attempt to study the effect of relationship between earnings management and institutional ownership on idiosyncratic volatility. Based on the hypothesis, our dependent variable is idiosyncratic volatility. Following discussion provides the details for measurement of variables

Table 1. Distribution of firms in sample

		Financial Year								
Sector	NIC - 2 Digit	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	Total
Manufacturing	10 , 11, 13, 14, 17, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 30, 32, 34	164	182	197	204	203	213	223	209	**1595**
Construction	41, 42	12	11	15	15	19	25	27	27	**151**
Wholesale and retail trade	46	3	3	6	8	8	8	9	9	**54**
Transportaion and Storage	50, 52	4	5	8	15	16	15	16	15	**94**
Accomodation and food services	55	3	2	2	3	3	3	4	4	**24**
Information and Communication	58, 59, 61, 62, 63	16	19	21	33	37	38	41	43	**248**
Real Estate Activities	68	1	1	1	3	11	12	13	13	**55**
Total		**203**	**223**	**250**	**281**	**297**	**314**	**333**	**320**	**2221**

3.3.1 Dependent Variable

Idiosyncratic volatility: Our measure of idiosyncratic stock return volatility is based on Ferreira and Laux (2007). Specifically, we use the market model and regress excess daily return for each stock for each year on the excess returns of market. For stock *i*,

$$r_{id} = \alpha_i + \beta_i r_{md} + \varepsilon_{id} \quad (7)$$

where, r_{id} is the excess daily return on stock i on day d, r_{md} is the excess daily return on market index on day d and $E(\varepsilon_{id}) = Cov(r_{md}, \varepsilon_{id}) = 0$. Under this market model, the $\beta_i = \sigma_{im}/\sigma^2_m$, where $\sigma_{im} = Cov(r_{id}, r_{md})$ and $\sigma^2_m = Var(r_{md})$. Idiosyncratic volatility is then defined as the variance of the error term and can be measured as below:

$$\sigma^2_{ie} = \sigma^2_i - (\sigma^2_{im}/\sigma^2_m) \quad (8)$$

where $\sigma^2_i = Var(r_{id})$. We use daily return of the stock i and market index to compute idiosyncratic volatility and multiply it by 250 to annualize. Further, for robustness testing, we also compute idiosyncratic volatility using Fama and French (1992) three-factor model. In order to apply the Fama and French (1992) three fator maodel, we first classify all stocks using two classifications for each year. First classification is between small stocks and big stocks. We use market capitalization of stocks at the beginning of each year for this classification. The stocks are then classified into small stocks (S) bottom 50 percent and big stocks (B) top 50 percent. Second classification is based on value factor using price to book (P/B) ratio. We classify all stocks into three groups low (L) bottom 33.33 percent, Medium (M) 33.33 percent to 66.66 percent and high (H) top 33.33 percent. Based on the intersection of the above two classifications we form six portfolios i.e S/L, S/M, S/H, B/L, B/M and B/H. Next we compute the size and value variables on a daily basis for the Fama and French (1992) three factor model. Specifically, the size variable (SMB) is computed as below:

$$SMB = ((S/L + S/M + S/H) - (B/L + B/M + B/H))/3 \quad (9)$$

where S/L is the average daily return of the portfolio of small and low value (distressed) stocks. Other variables have the analogous definition. The value variable (HML) is computed as below:

$$HML = ((S/H + B/H) - (S/L + B/L))/2 \quad (10)$$

After computing the size and value variables we run the Fama and French (1992) three factor model. Specifically, we run the below regression equation: The idiosyncratic volatility is then computed in the similar way that of the market model.

$$r_{id} = \alpha_i + \beta_i r_{md} + \beta_{smb} SMB + \beta_{hml} HML + \varepsilon_{id} \quad (11)$$

3.3.2 Independent Variables

Earnings management: Observing earnings management directly in the financial statements of a firm is not possible. One way to estimate the potential earnings management is to look for innovations in accruals relative to changes in the firm fundamentals such as sales and property, plant and equipment. Deviations of accruals from those determined by firm's fundamental factors are deemed to be influenced by management's discretion and are thus called discretionary accruals. Discretionary accruals are thus considered the proxy for earnings management.

In our base econometric model, we apply performance-matched discretionary accruals model using the approach suggested by Kothari et al (2005). Specifically we estimate the following regression for each industry having at least 10 firms in year t.

$$TA_{it}/A_{it-1} = \alpha_0 + \alpha_{1i}(1/A_{it-1}) + \beta_{1i}[(\Delta REV_{it}/A_{it-1})-(\Delta REC_{it}/A_{it-1})] + \beta_{2i}(PPE_{it}/A_{it-1}) + \beta_{3i}ROA_{it-1} + \varepsilon_{it} \quad (12)$$

where TA is firm i's total accruals in year t and are computed using balance sheet approach. Under balance sheet approach, total accruals are the change in non-cash current assets less change in current liabilities (excluding the current portion of long-term debt) less depreciation. ΔREV is change in sales for firm I in year t, ΔREC is change in firms receivables in year t, PPE is property, plant and equipment of firm I in year t, ROAit-1 is lagged return on assets and Ait-1 is lagged total assets of the firm. Form this projection we compute non-discretionary accruals for the sample firms for each year as below,

$$NDA_{it}/A_{it-1} = \alpha_0 + \alpha_{1i}(1/A_{it-1}) + \beta_{1i}[(\Delta REV_{it}/A_{it-1})-(\Delta REC_{it}/A_{it-1})] + \beta_{2i}(PPE_{it}/A_{it-1}) + \beta_{3i}ROA_{it-1} \quad (13)$$

The discretionary accruals are then the difference in total accruals and estimated non-discretionary accruals. Firms may have motives to either income-increasing discretionary accruals or income-decreasing accruals. In either case, discretionary accruals represent earnings management. Following previous literature (mention few studies here), we consider the absolute value of discretionary accruals. In addition to the Kothari et al (2005) model, for robustness check we use Jones (1991) Model and Modified Jones (1995) model by Dechow et al (1995). For Jones model (1991) we estimate the following regression for each industry that has at least 10 firms in year t:

$$TA_{it}/A_{it-1} = \alpha_i(1/A_{it-1}) + \beta_{1i}(\Delta REV_{it}/A_{it-1}) + \beta_{2i}(PPE_{it}/A_{it-1}) + \varepsilon_{it} \quad (14)$$

From this, the non-discretionary accruals are estimated as below:

$$NDAit/Ait\text{-}1 = \alpha_i(1/A_{it-1}) + \beta_{1i}(\Delta REV_{it}/A_{it-1}) + \beta_{2i}(PPE_{it}/A_{it-1}) \quad (15)$$

The discretionary portion of accruals is then the difference in total accruals and non-discretionary accruals. For the Modified Jones (1995) model, we estimate the non-discretionary accruals as below:

$$NDA_{it}/A_{it-1} = \alpha_i(1/A_{it-1}) + \beta_{1i}[(\Delta REV_{it}/A_{it-1})-(\Delta REC_{it}/A_{it-1})] + \beta_{2i}(PPE_{it}/A_{it-1}) \quad (16)$$

Again, the discretionary component of accruals is the difference between total accruals and non-discretionary accruals.

Institutional Ownership: Based on our second hypothesis, we attempt to look for the effect of the interaction of earnings management and institutional ownership. For this purpose, we compute institutional ownership as the percentage of shares held by Institutions.

3.3.3.Instruments and Control variables

Based on the literature and to actively control endogenity, we use number of instrumental variables in our specification. These variables are:

Lagged value of idiosyncratic volatility (IV_{t-1}): We use lagged value of idiosyncratic volatility to predict earnings management. We include lagged value of idiosyncratic volatility to control endogenity problem.

Institutional shareholding (IS_{t-1}): As discussed above, institutional shareholding may have varied effects on the level of earnings management. Therefore, we include institutional shareholding as one of the predictors of earnings management.

Board of directors characteristics: Prior literature suggest that board of directors characteristics have significant effect on levels of earnings management. The characteristics may include the independence of the board, diligence of the board and busyness of the board. We include three measures related to board of directors to predict the level of earnings management. These three measures are:

Percentage of independent directors (PID_{t-1}): Independent directors play critical role in overall governance of the firm. Prior literature also suggest that percentage of independent directors may reduce the level of earnings management in the firm. Hence, we include percentage of independent director as one of predictors of earnings management.

Percentage of Board meetings attended by directors (PBM_{t-1}): Unless the board is diligent, it may act only as a rubber stamp to attest the actions of the management without much review. In such as situation, the managers may go scot free with practices of earnings management. Percentage of board meetings attended by the directors measures the diligence of the board.

Average number of directorships in other companies (OCD_{t-1}): Busyness hypothesis suggest that higher the number of directorships held by the directors, more busy they are expected to be and therefore the amount control reduces. In such a situation, the managers may have incentive to manage the earnings aggressively without being questioned by the directors. We measure the busyness of the directors by average number of directorships held in other firms.

Auditor (AudSize): An external auditor plays a critical role in detecting and controlling the level of earnings management. In that, Big four auditors are expected to be more diligent as they have their reputation on stake. We measure this factor with a dummy variable that takes the value of 1 if the auditor is a big 4 auditor and 0 otherwise.

Based on prior literature on idiosyncratic volatility and earnings management, we consider five control variables. These control variables include

Return on equity (ROE): This is measured as a ratio of profits after tax to total equity.

Leverage (LEV): This is measured as a ratio of total term liabilities to total assets.

Price to book ratio (PBR): This is measured as a ratio of market value of equity to book value of equity.

Size: This is measured by natural log of market capitalization

Age: This is measured by natural log of the number of years since listing on the National Stock Exchange (NSE) of India. Table 2 presents a summary of the variables used in our research.

Table 2. Description of variables

Variable	Description
Idiosyncratic Volatility	Annualized variance of unexplained returns in the market model and alternatively in Fama and French (1992) three factor model
Discretionary Accruals	Estimated using Kothari et al. (2005) model and alternatively using Modified Jones (1995) model and Jones (1991) model
Institutional Shareholding	Proportion of shares held by Institutional shareholders
Big 4 Auditor	Dummy variable that takes the value of 1 if the auditor is a big 4 audit firm, else 0
Percentage of independent directors	Percentage of independent directors in the board
Percentage of board meetings attended by directors	Average percentage of board meetings attended by the directors
Average directorships in other companies	Average number of directorships held in other companies by the directors
Return on Equity	Ratio of profits after tax to total equity
Leverage	Ratio of total term liabilities to total assets
Price to Book ratio	Ratio of market value of equity to book value of equity
Size	Natural log of market capitalization
Age	Natural log of the number of years

4 Results

4.1 Descriptive statistics

Table 3 presents the descriptive statistics. The idiosyncratic variance is essentially the variance of the unexplained returns in the market model, and alternatively, in the Fama-French (1992) three factor model. The average variance under market model is 0.162 and that under the Fama-French (1992) three factor model is 0.148. The variance under the Fama-French (1992) three factor model is less than that in the market model since the Fama-French (1992) three factor model is expected to explain the stock returns better than the market model. Earnings management under three alternative models viz. Kothari et al

(2005), Modified Jones (1995) and Jones (1991), have similar magnitude and distribution. On average the firms in the sample have 22% institutional shareholding. Further, 46 percent firms in the sample are audited by the big four auditors. On average 50 percent directors on the board are independent directors and the directors attend 78.5 percent meetings. Average directorships of the directors in other companies are 5.6.

Table 3. Descriptive statistics

Variable		Mean	Std. Deviation
Idiosyncratic Volatility (Market Model)	IV	.162	.097
Idiosyncratic Volatility (Fama and French (1992) three factor Model)	IV	.148	.086
Discretionary Accruals (Kothari et. al, 2005 Model)	EM	.100	.103
Discretionary Accruals (Modified Jones 1995 Model)	EM	.097	.099
Discretionary Accruals (Jones 1991 Model)	EM	.096	.100
Institutional Shareholding	IS	.220	.133
Big 4 Auditor	AUD	.461	.499
Percentage of independent directors	PID	.496	.150
Percentage of board meetings attended by directors	POBM	.785	.110
Average directorships in other companies	AOCD	5.626	3.048
Return on Equity	ROE	.208	.271
Leverage	LEV	.163	.153
Price to Book ratio	PBR	3.572	4.648
Size	Size	9.895	1.456
Age	Age	2.261	.649

4.2 Econometric results

Table 4 presents the results of our base model that tests the effect of earnings management and of interaction between earnings management and institutional shareholding on idiosyncratic volatility.

Table 4. 2SLS Regression of Idiosyncratic Volatility on Earnings Management and Institutional Shareholding

This table reports estimates of coefficients of 2SLS regression specified by below equations:

$$IV_{it} = \lambda_{IV0} + \lambda_{IV1}DA_{it-1} + \lambda_{IV2}DA_{it-1}*IS_{it-1} + \lambda_{IV3}ROE_{it-1} + \lambda_{IV4}Lev_{it-1} + \lambda_{IV5}PBR_{it-1} + \lambda_{IV6}Size_{it-1} + \lambda_{IV7}Age_{it-1} + \varepsilon_{it}$$

$$DA_{it-1} = \lambda_{EM0} + \lambda_{EM1}IV_{it-1} + \lambda_{EM3}IS_{it-1} + \lambda_{EM4}AudSize_{it-1} + \lambda_{EM5}PID_{it-1} + \lambda_{EM6}PBM_{it-1} + \lambda_{EM7}OCD_{it-1} + \lambda_{EM8}ROE_{it-1} + \lambda_{EM9}Lev_{it-1} + \lambda_{EM10}PBR_{it-1} + \lambda_{EM11}Size_{it-1} + \lambda_{EM12}Age_{it-1} + \varepsilon_{it}$$

Where IV is idiosyncratic volatility measured using market model under specification 1 and using Fama and French (1992) three factor model under specification 2 and DA is discretionary accruals estimated using Kothari et al. (2005) model. The other factors are institutional shareholding (IS), return on equity (ROE), leverage (LEV), price to book ratio (PBR), market capitalization (Size), firm age (Age), dummy for big 4 auditor (AudSize), percentage of independent directors in the board (PID), average percentage of board meetings attended by the directors (PBM), and average number of directorships held in other companies by the directors (OCD). Refer Table 2 for variable definition. Regression includes industry fixed effects. Column 1 provides coefficients and the p-value in parentheses corresponding to the Student t statistic and column 2 provide heteroskedasticity robust standard errors under specification 1. Column 3 provides coefficients and the p-value in parentheses corresponding to the Student t statistic and column 4 provide heteroskedasticity robust standard errors under specification 2.

	Specification 1: IV Market Model		Specification 2: IV Fama and French (1992) Three Factor Model	
	Coefficient	H.C.Std. Err.	Coefficient	H.C.Std. Err.
	(1)	(2)	(3)	(4)
Const	-0.201	0.241	-0.212	0.225
	(0.4034)		(0.3453)	
DA (Kothari et al., 2005)	4.353***	1.516	4.008***	1.426
	(0.0041)		(0.0049)	
DA x IS	1.503	0.927	1.425*	0.856
	(0.105)		(0.0959)	
ROE	0.103	0.088	0.095	0.081
	(0.2394)		(0.2447)	
Lev	0.297***	0.09	0.264***	0.084
	(0.001)		(0.0017)	
PBR	-0.018**	0.009	-0.016**	0.008
	(0.0381)		(0.045)	
Size	-0.008	0.009	-0.006	0.009
	(0.3762)		(0.5092)	
Age	0.027	0.029	0.025	0.027
	(0.350)		(0.3631)	
Industry Fixed Effects	Yes		Yes	
Hausman test statistic	253.994***		262.927***	
	(0.0000)		(0.0000)	
Sargan over-identification test statistic	5.665		5.602	
	(0.2256)		(0.2309)	
N	2221		2221	

***denotes significant at 1%; ** at 5%; and * at 10% level

The model has been used under two specifications for robustness. Under Specification 1, idiosyncratic volatility has been computed using the market model, whereas under specification 2 the Fama and French (1992) three-factor model has been used to compute the idiosyncratic volatility. Under both specifications, heteroskedasticity-consistent standard errors have been used to take care of any potential heteroskedasticity issues.

The Hausman test has been used to estimate the consistency and efficiency of 2sls against OLS. The null hypothesis for this test is that OLS estimates are consistent and efficient. The Hausman test statistic is significant at 5 percent level. Therefore, the null hypothesis is rejected in favor of 2sls. Further, the Sargan over-identification test has been used to estimate whether the model is over-identified. The null hypothesis for this test is that all instruments are valid. In other words, the model is not over-identified. The test statistic is not significant at 5% level and therefore the null hypothesis is not rejected. Overall, both the Hausman test and Sargan over-identification test suggest that the model has an appropriate fit.

The results of the model, under both specification 1 and specification 2, provide support for hypothesis 1. We observed that discretionary accruals have a positive and significant effect on idiosyncratic volatility (Under Specification 1: β = 4.353, p-value = 0.0041; Under Specification 2: β=4.008, p-value =0.0049). However, results failed to indicate support at 5% significance level for hypothesis 2, which posited an incremental effect of institutional shareholding on the relationship between earnings management and idiosyncratic volatility. Under specification 1, the coefficient of the interaction term is positive but significant only at 10.5% level. Under specification 2, the coefficient of the interaction term is positive and significant only at 10% level. Therefore, we have only limited support for hypothesis 2 and therefore it is difficult to suggest that institutional shareholding causes an increase in the effect of earnings management on idiosyncratic volatility.

Further, we investigated whether non-strategic institutional shareholding has an incremental effect on the relationship between earnings management and idiosyncratic volatility. For this purpose, we excluded

promoter-institutional shareholding and analyzed the role of non-promoter institutional shareholders. Therefore, we changed the specification of institutional shareholding with non-promoter institutional shareholding. Table 5 presents the results:

Table 5. 2SLS Regression of Idiosyncratic Volatility on Earnings Management and Non- Promoter Institutional Shareholding

This table reports estimates of coefficients of 2SLS regression specified by below equations:

$$IV_{it} = \lambda_{IV0} + \lambda_{IV1}DA_{it-1} + \lambda_{IV2}DA_{it-1}*NPIS_{it-1} + \lambda_{IV3}ROE_{it-1} + \lambda_{IV4}Lev_{it-1} + \lambda_{IV5}PBR_{it-1} + \lambda_{IV6}Size_{it-1} + \lambda_{IV7}Age_{it-1} + \varepsilon_{it}$$

$$DA_{it-1} = \lambda_{EM0} + \lambda_{EM1}IV_{it-1} + \lambda_{EM3}IS_{it-1} + \lambda_{EM4}AudSize_{it-1} + \lambda_{EM5}PID_{it-1} + \lambda_{EM6}PBM_{it-1} + \lambda_{EM7}OCD_{it-1} + \lambda_{EM8}ROE_{it-1} + \lambda_{EM9}Lev_{it-1} + \lambda_{EM10}PBR_{it-1} + \lambda_{EM11}Size_{it-1} + \lambda_{EM12}Age_{it-1} + \varepsilon_{it}$$

Where IV is idiosyncratic volatility measured using market model under specification 1 and using Fama and French (1992) three factor model under specification 2, DA is discretionary accruals estimated using Kothari et al. (2005) model and NPIS is non-promoter institutional sharholding. The other factors are institutional shareholding (IS), return on equity (ROE), leverage (LEV), price to book ratio (PBR), market capitalization (Size), firm age (Age), dummy for big 4 auditor (AudSize), percentage of independent directors in the board (PID), average percentage of board meetings attended by the directors (PBM), and average number of directorships held in other companies by the directors (OCD). Refer Table 2 for variable definition. Regression includes industry fixed effects. Column 1 provides coefficients and the p-value in parentheses corresponding to the Student t statistic and column 2 provide heteroskedasticity robust standard errors under specification 1. Column 3 provides coefficients and the p-value in parentheses corresponding to the Student t statistic and column 4 provide heteroskedasticity robust standard errors underspecification 2.

	Specification 1: IV Market Model		Specification 2: IV Fama and French (1992) Three Factor Model	
	Coefficient	H.C.Std. Err.	Coefficient	H.C.Std. Err.
Const	-0.201	0.2424	-0.2117	0.2261
	(0.407)		(0.3491)	
DA (Kothari et al., 2005)	4.3578***	1.5265	4.0119	1.4348
	(0.0043)		(0.0052)	
DA x NPIS	1.7132*	0.9735	1.6244	0.8993
	(0.0784)		(0.0709)	
ROE	0.104	0.0886	0.0954	0.0821
	(0.2403)		(0.2456)	
Lev	0.3018***	0.0913	0.26815	0.0851
	(0.001)		(0.0016)	
PBR	-0.0179**	0.00865	-0.0162	0.0081
	(0.0385)		(0.0454)	
Size	-0.0088	0.00945	-0.0062	0.0088
	(0.3511)		(0.4774)	
Age	0.0271	0.0295	0.0246	0.0276
	(0.3591)		(0.3725)	
Industry Fixed Effects	Yes		Yes	
Hausman test statistic	256.8876		266.7694	
	(0.0000)		(0.0000)	
Sargan over-identification test statistic	5.4774		5.3989	
	(0.2417)		(0.2488)	
N	2221		2221	

***denotes significant at 1%; ** at 5%; and * at 10% level

The results are similar to our base model. The interaction between earnings management and non-promoter institutional shareholding is positive but significant only at 8% significance level as compared to 10% in the base model. Therefore, it is difficult to conclude that the institutional shareholding (whether strategic or non-strategic) enhances the effect of earnings management on idiosyncratic volatility.

4.3 Robustness check

We perform robustness testing of our base model in two ways. First, we estimate discretionary accruals using Modified Jones (1995) model and Jones (1991) model. Second, we use Generalized Method of Moments (GMM) to substantiate the results of our base model.

Table 6 and 7 presents the results where Modified Jones (1991) model and Jones (1991) model respectively have been used to estimate earnings management.

Table 6. 2SLS Regression of Idiosyncratic Volatility on Earnings Management and Institutional Shareholding

This table reports estimates of coefficients of 2SLS regression specified by below equations:

$$IV_{it} = \lambda_{IV0} + \lambda_{IV1}DA_{it-1} + \lambda_{IV2}DA_{it-1}*IS_{it-1} + \lambda_{IV3}ROE_{it-1} + \lambda_{IV4}Lev_{it-1} + \lambda_{IV5}PBR_{it-1} + \lambda_{IV6}Size_{it-1} + \lambda_{IV7}Age_{it-1} + \varepsilon_{it}$$

$$DA_{it-1} = \lambda_{EM0} + \lambda_{EM1}IV_{it-1} + \lambda_{EM3}IS_{it-1} + \lambda_{EM4}AudSize_{it-1} + \lambda_{EM5}PID_{it-1} + \lambda_{EM6}PBM_{it-1} + \lambda_{EM7}OCD_{it-1} + \lambda_{EM8}ROE_{it-1} + \lambda_{EM9}Lev_{it-1} + \lambda_{EM10}PBR_{it-1} + \lambda_{EM11}Size_{it-1} + \lambda_{EM12}Age_{it-1} + \varepsilon_{it}$$

Where IV is idiosyncratic volatility measured using market model under specification 1 and using Fama and French (1992) three factor model under specification 2 and DA is discretionary accruals estimated using Modified Jones (1995) model. The other factors are institutional shareholding (IS), return on equity (ROE), leverage (LEV), price to book ratio (PBR), market capitalization (Size), firm age (Age), dummy for big 4 auditor (AudSize), percentage of independent directors in the board (PID), average percentage of board meetings attended by the directors (PBM), and average number of directorships held in other companies by the directors (OCD). Refer Table 2 for variable definition. Regression includes industry fixed effects. Column 1 provides coefficients and the p-value in parentheses corresponding to the Student t statistic and column 2 provide heteroskedasticity robust standard errors under specification 1. Column 3 provides coefficients and the p-value in parentheses corresponding to the Student t statistic and column 4 provide heteroskedasticity robust standard errors under specification 2.

	Specification 1: IV Market Model		Specification 2: IV Fama and French (1992) Three Factor Model	
	Coefficient	HC Std. Err.	Coefficient	HC Std. Err.
Const	-0.206	0.203	-0.210	0.186
	(0.3099)		(0.2574)	
DA (Mod. Jones, 1995)	3.802***	1.068	3.464***	0.98
	(0.0004)		(0.0004)	
DA x IS	1.527*	0.828	1.439	0.755
	(0.0652)		(0.0568)	
ROE	-0.011	0.065	-0.011	0.059
	(0.8633)		(0.8538)	
Lev	0.285***	0.074	0.251***	0.068
	(0.0001)		(0.0002)	
PBR	-0.012**	0.006	-0.01*	0.005
	(0.0444)		(0.0543)	
Size	-0.008	0.008	-0.006	0.007
	(0.3012)		(0.4305)	
Age	0.05191*	0.029	0.047*	0.027
	(0.0747)		(0.0784)	
Industry Fixed Effects	Yes		Yes	
Hausman test statistic	337.747***		350.609	
	(0.0000)		(0.0000)	
Sargan over-identification test statictic	4.708		4.748	
	(0.3186)		(0.3142)	
N	2221		2221	

***denotes significant at 1%; ** at 5%; and * at 10% level

Table 7. 2SLS Regression of Idiosyncratic Volatility on Earnings Management and Institutional Shareholding

This table reports estimates of coefficients of 2SLS regression specified by below equations:

$IV_{it} = \lambda_{IV0} + \lambda_{IV1}DA_{it-1} + \lambda_{IV2}DA_{it-1}*IS_{it-1} + \lambda_{IV3}ROE_{it-1} + \lambda_{IV4}Lev_{it-1} + \lambda_{IV5}PBR_{it-1} + \lambda_{IV6}Size_{it-1} + \lambda_{IV7}Age_{it-1} + \varepsilon_{it}$

$DA_{it-1} = \lambda_{EM0} + \lambda_{EM1}IV_{it-1} + \lambda_{EM3}IS_{it-1} + \lambda_{EM4}AudSize_{it-1} + \lambda_{EM5}PID_{it-1} + \lambda_{EM6}PBM_{it-1} + \lambda_{EM7}OCD_{it-1} + \lambda_{EM8}ROE_{it-1} + \lambda_{EM9}Lev_{it-1} + \lambda_{EM10}PBR_{it-1} + \lambda_{EM11}Size_{it-1} + \lambda_{EM12}Age_{it-1} + \varepsilon_{it}$

Where IV is idiosyncratic volatility measured using market model under specification 1 and using Fama and French (1992) three factor model under specification 2 and DA is discretionary accruals estimated using Jones (1991) model. The other factors are institutional shareholding (IS), return on equity (ROE), leverage (LEV), price to book ratio (PBR), market capitalization (Size), firm age (Age), dummy for big 4 auditor (AudSize), percentage of independent directors in the board (PID), average percentage of board meetings attended by the directors (PBM), and average number of directorships held in other companies by the directors (OCD). Refer Table 2 for variable definition. Regression includes industry fixed effects. Column 1 provides coefficients and the p-value in parentheses corresponding to the Student t statistic and column 2 provide heteroskedasticity robust standard errors under specification 1. Column 3 provides coefficients and the p-value in parentheses corresponding to the Student t statistic and column 4 provide heteroskedasticity robust standard errors under specification 2.

	Specification 1: IV Market Model		Specification 2: IV Fama and French (1992) Three Factor Model	
	Coefficient	HC Std. Err.	Coefficient	HC Std. Err.
Const	-0.246	0.234	-0.249	0.217
	(0.2936)		(0.2522)	
DA (Jones, 1991)	4.679***	1.469	4.277***	1.358
	(0.0015)		(0.0016)	
DA x IS	2.155**	1.083	2.019**	0.99
	(0.0466)		(0.0414)	
ROE	-0.084	0.141	-0.077	0.128
	(0.5528)		(0.5474)	
Lev	0.334***	0.102	0.296***	0.094
	(0.0011)		(0.0017)	
PBR	-0.013	0.008	-0.011	0.007
	(0.1076)		(0.1245)	
Size	-0.009	0.01	-0.007	0.009
	(0.3176)		(0.4288)	
Age	0.055	0.033	0.05	0.031
	(0.0992)		(0.1037)	
Industry Fixed Effects	Yes		Yes	
Hausman test statistic	387.623		402.215	
	(0.0000)		(0.0000)	
Sargan over-identification test statictic	1.996		2.018	
	(0.7364)		(0.7324)	
N	2221		2221	

***denotes significant at 1%; ** at 5%; and * at 10% level

The results are similar as that of the base model. Earnings management has a positive and significant (at <1% significance level) relationship with idiosyncratic volatility. The relationship between idiosyncratic volatility and interaction of earnings management with institutional shareholding remains positive but insignificant except when we use Jones (1991) model for estimating earnings management, in which case it becomes significant at 5% level. This provides limited evidence on the incremental effect of institutional shareholding on the relationship between earnings management and idiosyncratic volatility. Hausman's test statistic remains significant and Sargan's over-identification test statistic remains insignificant. For robustness purposes, we also test our base model using GMM. Table 8 provides the results of GMM

Table 8. GMM Estimation of Idiosyncratic Volatility on Earnings Management and Institutional Shareholding

This table reports estimates of coefficients of GMM estimation specified by below equations:

$$IV_{it} = \lambda_{IV0} + \lambda_{IV1}DA_{it-1} + \lambda_{IV2}DA_{it-1}*IS_{it-1} + \lambda_{IV3}ROE_{it-1} + \lambda_{IV4}Lev_{it-1} + \lambda_{IV5}PBR_{it-1} + \lambda_{IV6}Size_{it-1} + \lambda_{IV7}Age_{it-1} + \varepsilon_{it}$$

$$DA_{it-1} = \lambda_{EM0} + \lambda_{EM1}IV_{it-1} + \lambda_{EM3}IS_{it-1} + \lambda_{EM4}AudSize_{it-1} + \lambda_{EM5}PID_{it-1} + \lambda_{EM6}PBM_{it-1} + \lambda_{EM7}OCD_{it-1} + \lambda_{EM8}ROE_{it-1} + \lambda_{EM9}Lev_{it-1} + \lambda_{EM10}PBR_{it-1} + \lambda_{EM11}Size_{it-1} + \lambda_{EM12}Age_{it-1} + \varepsilon_{it}$$

Where IV is idiosyncratic volatility measured using market model under specification 1 and using Fama and French (1992) three factor model under specification 2 and DA is discretionary accruals estimated using Kothari et al. (2005) model. The other factors are institutional shareholding (IS), return on equity (ROE), leverage (LEV), price to book ratio (PBR), market capitalization (Size), firm age (Age), dummy for big 4 auditor (AudSize), percentage of independent directors in the board (PID), average percentage of board meetings attended by the directors (PBM), and average number of directorships held in other companies by the directors (OCD). Refer Table 2 for variable definition. Regression includes industry fixed effects. Column 1 provides coefficients and the p-value in parentheses corresponding to the Student t statistic and column 2 provide standard errors under specification 1. Column 3 provides coefficients and the p-value in parentheses corresponding to the Student t statistic and column 4 provide standard errors under specification 2.

	Specification 1: IV Market Model		Specification 2: IV Fama and French (1992)Three Factor Model	
	Coefficient	Std. Err.	Coefficient	Std. Err.
const	-0.2003	0.2391	-0.2094	0.222
	(0.4022)		(0.3456)	
DA (Kothari et al.,2005)	4.4279***	1.5063	4.0574***	1.41
	(0.0033)		(0.004)	
DA x IS	1.3091	0.9141	1.263	0.8409
	(0.1521)		(0.1331)	
ROE	0.1323	0.0838	0.1201	0.0774
	(0.1145)		(0.1207)	
Lev	0.2750***	0.0889	0.2424***	0.0824
	(0.0020)		(0.0033)	
PBR	-0.0194**	0.0083	-0.0174**	0.0077
	(0.0192)		(0.0239)	
Size	-0.0075	0.0092	-0.0053	0.0085
	(0.4187)		(0.5379)	
Age	0.0265	0.0292	0.0235	0.0271
	(0.3625)		(0.3868)	
Industry Fixed Effects	Yes		Yes	
GMM criterion [Q(b)]	0.0024		0.0024	
J Test	5.36626		5.38	
	(0.2517)		(0.2505)	
N	2221		2221	

***denotes significant at 1%; ** at 5%; and * at 10% level

Results under GMM are consistent with the results of the base model under 2SLS. The relationship between earnings management and idiosyncratic volatility remains positive and significant. However, relationship between idiosyncratic volatility and interaction of earnings management with institutional shareholding is positive but insignificant.

5 Conclusion

Recent work in finance literature has attempted to study the sources of idiosyncratic volatility. In this paper, we investigate whether accrual based earnings management is associated with higher idiosyncratic return volatility. We use three measures for accrual based earnings management viz. performance matched discretionary accruals model (Kothari et al., 2005), Modified Jones (1995) model and Jones (1991) model and two measures of idiosyncratic volatility using market model and Fama and French (1992) three-factor model. We also investigate whether institutional shareholding increases the effect of earnings management on idiosyncratic volatility. We use a sample of 2221 Indian firm -years from the firms listed on National Stock Exchange (NSE) and

part of S&P CNX 500 Index. We use 2SLS regression to actively control for endogenity concerns.

Based on our analysis on Indian Companies' data, we find that idiosyncratic volatility is positively related with accrual based earnings management. These results are consistent with Rajgopal and Venkatachalam (2011) and Cheng et al. (2012). The results suggest that stock returns of a firm that aggressively manages the earnings contain higher firm specific shocks than others.

Our results, however, do not suggest that institutional shareholding significantly affect the association between earnings management and idiosyncratic volatility. The results are similar even if we consider ownership of non-promoter institutional shareholders. These results imply that irrespective of the level of institutional shareholding in a firm, the effect of earnings management on idiosyncratic volatility remains same.

Our study makes following contributions to the existing literature. Firstly, understanding that discretionary accruals have positive and significant association with idiosyncratic volatility can help investors identifying better diversification strategies. In order to reduce volatility of the portfolio, investors may diversify their portfolios by investing in firms with lower discretionary accruals. Secondly, managers may be able to reduce the cost of capital of firms by reducing idiosyncratic volatility by increasing the transparency in financial reporting. Finally, ours is the first study in Indian context that empirically test the association between idiosyncratic volatility and earnings management. If the practices of earnings management are widespread due to weak legal enforcement system as argued by Jian and Wong (2003) and Leuz et al. (2003), then the results of our study are important for policy makers in India to improve the legal enforcement.

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