

RESEARCH ARTICLE

Earning information content changes based on accrual measures and quality measures: Evidences from member countries of Asia Pacific trade agreement

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Abstract

The primary purpose of the study to identify the impact of accruals measures and quality measures on the earning information content that effects market value, while keeping in view the measures of Dechow, Sloan, and Sweeney (1996); Kothari, Leone, and Wasley (2005) and Barton and Simko (2002). The results from 802 companies selected from member countries of APTA indicated that, in all countries except Bangladesh, the earning management is not performed for improving earning informativeness in market and rather it is done for achieving manager's personal benefit. The specific behaviour is seen in India and Sri Lanka in which the higher accrual quality reduces the pricing of earning in market. This behaviour is due to the fact that investors are uninformed. Moreover, this behaviour is due to information asymmetry. The earning quality also has negative influence on earning informativeness towards market value in case of India and Bangladesh, which suggest that overstatement of beginning net operating assets have negative effect on earning information content as this overstatement reduces returns on asset due to overstated denominator, rather it restricts managers from biased earnings. However, in other countries it works in a way suggested by Barton and Simko (2002). The market value measure of India has greater dependency on interaction term as compared to China and Pakistan due to lower price synchronicity. China also has greater influence of interaction term on its company's market values than Pakistan.

KEYWORDS

accrual quality, discretionary accruals, earning quality, earning informativeness, panel data model, redundancy

JEL CLASSIFICATION

M410; M48

1 | INTRODUCTION

Earning, also known as net income is the most significant item of financial statement. It depicts the efficiency of the

company towards value added activities. Earning also provides information, which help the investors in allocation of resources in the capital markets (Lev, 1989). Normally, the hypothetical value of the company stock is

based on the present value of the future earnings of the firm. Higher the earnings, higher the company value and lower earnings signals a decreased firm value (Lev, 1989).

The value relevancy of the earnings was first depicted by Ball and Brown (1968). Afterwards, different studies¹ proved the information content of the earnings for market valuation of the firm. Bowen (1981); Daley (1984); Fairfield, Sweeney, and Yohn (1996); and Lipe (1986) showed the components of earning that are defined by accounting classification have information content. The results also documented that persistence of earning is linked with permanent constituent of earnings while temporary component reduces earning persistency.²

Hicks (1939) further demonstrated that the “true Earnings” are not observable which permits the GAAP to provide many accounting choices thereby facilitating earning management. In context of firm or organization, earning management might be considered as the legal and reasonable decisions regarding financial reporting with the objective to attain predictable and steady financial results in corporate world.

The earning management can be practiced by manager either in useful and productive manner or in some appalling and scandalous manner. Researchers³ termed these managerial attitudes as efficient earning management and opportunistic earning management. Efficient earning management improves earning informative efficiency of private information and improve market value of the firm and opportunistic earning management report earnings that maximize manager personal utility opportunistically (Scott, 2000). Primal studies⁴ concluded the role of earning management as a characteristic of earnings that effect the information content of earnings, which ultimately retorted in market value (Sloan, 1996). The information content of earnings or market pricing of earnings or informativeness of earnings can be defined as the extent to which the earnings provide information, about firm condition, to the market⁵ (Li, 2019; Wu & Giles, 2013). The characteristics of earnings include earning management, accrual quality and earning quality. The purpose of this study is to examine how the characteristics of earnings effect informativeness of earning.

In recent years, the earning management been evolved as vital aspect of accounting due to convergence of accounting rules. It has been identified that earning management is performed by almost all the firms which raises the question that whether the market respond to characteristics of earnings that includes earning management? Such question provides motivation to study relevancy of earnings in the market. The motivation behind this study lies in various folds, Firstly, Does the relevancy of earnings in the market is affected by the dynamics of earnings characteristics. Secondly, how the earning

informativeness responds to different types of earning management (i.e., opportunistic earning management and efficient earning management). Thirdly, how much sensitive is the earning informativeness towards characteristics of earnings (Haga, Ittonen, Tronnes, & Wong, 2018).

Despite that earning quality concept was developed prior to earning management,⁶ the research on earning quality was triggered in 1990s, when firms were engaged in opportunistic earning management, with the purpose of surviving in competing market (Levitt, 1998). This assertion spurred the interest of research in earning quality. Earning quality can be referred to as persistence of earnings. Earning Quality is also one of the descriptive characteristic of Earning (Lev, 1989). Prior researches documented the reduction in earning relevancy (Givoly & Hayn, 2000), increase in volatility of earning (Collins, Maydew, & Weiss, 1997; Lev & Zarowin, 1999), and reduction in matching of revenue and expenses (Dichev & Tang, 2008) effects earnings information content that effects market value.

Literature suggested that, the information risk⁷ is non-diversifiable risk (Easley & O'hara, 2004; O'Hara, 2003) and one of the proxy of information risk is accrual quality (Francis, LaFond, Olsson, & Schipper, 2005; Slack, Shrivies, Hussainey, & Mouselli, 2010). Accrual quality is defined as the variation of accruals, it is also referred to as information risk measure. Francis et al. (2005) analysed the pricing behaviour of investor towards accrual quality as proxy of information risk. Their findings depicted that, the poor accrual quality leads to larger cost of debt and equity under different accrual quality specifications, which implies that accrual quality depicts the information risk that ultimately effects earning and market value. Prior studies evidenced that firms with better accrual quality improves valuation role of earnings (Dechow & Dichev, 2002; Francis et al., 2005; McNichols, 2002).

The purpose of the study is to identify the impact of earning management, earning quality, accrual quality on informativeness of earnings and market value in member countries of Asia Pacific trade agreement (APTA). Prior studies identified earning management, earning quality, and accrual quality as descriptive characteristics of earning, while ignoring their impact on informativeness of earning. Findings of this study has important implications to member countries of APTA in terms of earning management behaviour of the firm and also in terms of earning and market value sensitivity to earning management, earning quality and accrual quality. Prior studies concluded that emerging countries of Asia is prone to earning management as compared to other developed countries due to investor protection (Kitiwong, Verma, &

Anderson, 2014; Sheng, 2014) motivated to study the countries that have trade ties for economic betterment like member countries of APTA. The APTA includes member countries like China, India, Sri Lanka, Bangladesh, and Pakistan (acceding member).

Detecting the earning management intentions (opportunistic or efficient) of a manager through the nature of information contents of earnings, generated by earning management, that effects market value is the major contribution of this study. This study helps the stakeholders, auditors, and owners to identify the managerial attitudes through informativeness of earnings that signals firm market value. Prior studies are mostly focused on driving forces for earning management,⁸ which leads to change in business fundamentals. Similarly, previous studies⁹ on earning quality are inclined towards their impact on different fundamentals, which are sensitive to market value, like ownership structure, audit characteristics, and other economic level events, thus discounting its impact on earning informativeness. Studies¹⁰ related to accrual quality attempted to address the direct impact of accrual quality on stock returns. Though, the impact of accrual quality, as book measure, on earning informativeness and market value is still unaddressed.

2 | HYPOTHESIS DEVELOPMENT AND LITERATURE

The economic based concept of earnings was developed by Hicks (co-author of GAAP rules) in 1939 book value and capital (Hicks, 1939). Hicks demonstrated that the “true Earnings” are not observable which permits the GAAP to provide many accounting choices thereby facilitating earning management. Afterwards, various definitions of earning management have been stated by different researchers.¹¹ However, the comprehensive definition is detailed by Healy and Wahlen (1999) that earning management occurs when manager use judgment in financial reporting and in structuring transactions to alter financial reports either to mislead some stakeholders about the underlying economic performance of the company, or to influence contractual outcomes that depend on reported accounting numbers. There are different phrases that describe earning management such as earning smoothing, creative accounting, window dressing etc., but most commonly earning smoothing is used to denote positive earning management.

With the development of earning management concepts, several studies have been conducted on the measurement of earning management and its impact on other prospects of business. Extent of earning management can be calculated by various methods like accruals,

changes in accounting standards, and changes in capital structure. Previous studies (DeAngelo, 1986; Healy, 1985; McNichols & Wilson, 1988) adopted certain measurement of accruals as a proxy of earning management and also established the partitioning of accruals as discretionary component and non-discretionary component. Previous studies also lack the empirical estimation of accruals. Jones (1991) first time empirically estimated the earning management through accruals and accurately standardized the proxy of discretionary accruals (all accounts) as measure of earning management. Previous studies used discretionary component of single account (McNichols & Wilson, 1988) as a measure of earning management. The further modification of Jones model (Dechow, Sloan, & Sweeney, 1996) also followed same operationalization of earning management. Ohlson (2014) revisited the accruals as the measure of earning management and contributed to literature that accruals can be misleading in certain circumstances, but on average accruals provide useful information.

The modified Jones model (Dechow et al., 1996) of discretionary accruals was also subjected to further extensions and modifications. Larcker and Richardson (2004) employed book-to-market ratio (BM) and cash flows from operations (CFO) as explanatory variables in the Modified Jones Model. Kothari, Leone, and Wasley (2005) suggested the Performance-Matched Modified Jones (PM) Model by incorporating performance measure. Dechow, Richardson, and Tuna (2003) developed Forward Looking model by incorporating three adjustments in traditional modified Jones model in terms of account receivables, lagged value of accruals, and of future sales growth. However, the model suffer look ahead bias due to non-availability of leading growth sales information. Wan (2018) addressed this issue of look-ahead bias and proposed a modified Forward- Looking Model by using alternate proxy for sales growth and ROA (Dechow, Sloan, & Sweeney, 1995; Kothari et al., 2005; McNichols, 2001).

After the development of model for measurement of earning management, the studies are embryonically motivated towards the identifying earning management drivers, motives and modes and explaining impact of earnings management on earnings quality, cash flows, and other fundamentals of the firm, which were apparently considered as significant element of firm valuation. Chung, Ho, and Kim (2004) found that discretionary accruals enhance the relevancy of earnings. Hirshleifer, Hou, and Teoh (2009) concluded that the aggregate accruals are strong positive forecaster of aggregate stock returns and it is also strong predictor of abnormal returns (Du & Shen, 2018; Sloan, 1996). The impact of accruals on stock returns, earnings, and market value established

that accruals contains the information content in the market that not only effect current earnings and market value, but shows presence in the forecast. Prior studies (Pincus, Rajgopal, & Venkatachalam, 2007; Sloan, 1996; Xu & Lacina, 2009) established that firm with low accruals show higher returns than firms with higher accruals. However, overvaluation based on income increasing earning management is negatively linked with future abnormal stock returns (Chi & Gupta, 2009; Wang, Lin, Werner, & Chang, 2018). Aforementioned research endorsed that accruals have incremental information content in explaining market valuation and share prices and accruals capacity to forecast future cash flows is incrementally dependent on previous cash flow predictive ability (Cohen, Dey, & Lys, 2004; Dechow, 1994; Dechow, Kothari, & Watts, 1998; Pfeiffer Jr, Elgers, Lo, & Rees, 1998). The above study concludes that earning management incrementally effects market value, while ignoring that earning management also has detrimental impact on market value depending on the type of earning management (opportunistic and efficient) and nature of information content generated by certain type of earning management. The impact of discretionary accruals as the characteristics of earnings on earning informativeness is still unrevealed. From the above discussion related to discretionary accruals, the literature (Chi & Gupta, 2009; Wang et al., 2018) suggest the following first hypothesis that need to be tested empirically is:

Hypothesis H1. The earning informativeness or pricing of earnings in market is not a function of discretionary accruals in South Asian countries.

Fewer studies identified the non-discretionary portion of accruals. Non-discretionary accruals are the accounting based adjustments in operating cash flows, which is mandated by accounting standards as a control (Haw, Qi, & Wu, 2001). Non-discretionary accruals control or regulate the impact of changes in company economic situation (Kaplan, 1985; Mendes, Rodrigues, & Esteban, 2012). The literature mostly tested the direct association of discretionary accrual with business fundamentals. However, the impact of non-discretionary accruals on informativeness of earnings need to be addressed.

Hypothesis H2. The earning informativeness or pricing of earnings in market is not a function of non-discretionary accruals in South Asian countries.

Prior Studies (Dechow, 1994; Dimitropoulos, Asteriou, & Koumanakos, 2010; Haw et al., 2001) also identified impact of operating cash flow on market value, so present study also incorporate variation in cash flow

as control variable in the model. Cash flow from operations has the market value relevancy and information content (Dechow, 1994; Dimitropoulos et al., 2010; Haw et al., 2001), and cash flow from operations also guide the earning management (Chung, Firth, & Kim, 2005; Yoon & Miller, 2002) that ultimately effects market value. Cash flow forecast also provide vital information to investor for making decisions that affect market value (Call, Chen, & Tong, 2009, 2013; DeFond & Hung, 2003, 2007).

Hypothesis H3. The earning informativeness or pricing of earnings in market is independent on the variation of cash flow in South Asian countries.

Earning management practices are always be guided by the motive. Recent developments identified various motives that lead to earning management such as meeting or beating earning benchmark (Chen et al., 2010; Iatridis & Kadorinis, 2009), earnings pattern (Li et al., 2011), information asymmetry among market participants (Cormier et al., 2013; Dai et al., 2013), and industry characteristics (Datta et al., 2013). Large business group has more tools of earning management as compared to small firms (Beuselinck & Deloof, 2014; Lemma, Negash, Mlilo, & Lulseged, 2018; Nwaeze, 2011). Moreover, Ewert and Wagenhofer (2005); Roychowdhury (2006); Tan and Jamal (2006) empirically confirmed that earnings are managed through manipulation of business fundamental like taxes and causal reasoning. The literature concluded that, there are driving forces for earning management, which leads to change in business fundamentals that effect the earning and ultimately effect market value. So, it can be inferred that earning management has indirect relationship with firm valuation as a parameter of earnings, which need to be addressed.

The above studies depict the extensive adoption of earning management practices, which places the concern towards the earning quality as how the earning quality is affected through earning management and further effect the earning informativeness. The term earning quality was introduced early in 1934 by Graham and Dodd in describing equity valuation as earning per share times "coefficient of quality" (Graham & Dodd, 1934). The description of quality coefficient implies the definition of quality. O'Glove reintroduced the term in his practitioners oriented financial statement text book, *Quality of Earnings* published in 1987 (O'Glove, 1987). Lev (1989) specified the relationship between earning quality and equity valuation model and popularized "quality" as descriptive characteristic of earnings.

With the establishment of earning quality as an indicator of variation in earnings, several studies were carried out on characteristics and determinants of earning

quality (Watrin & Ullmann, 2012). The impact of different fundamentals, which are sensitive to market value, like ownership structure (Velury & Jenkins, 2006; Xu et al., 2012), audit characteristics (Kamarudin et al., 2012), information risk content (Gotti & Mastrolia, 2014), and other economic level events, on earning quality is also studied, while ignoring its impact on market pricing of earnings.

Earning management has a lot in common with earning quality. Normally highly managed earnings depict low earning quality, but lack of earning management is not enough to ensure high earning quality as it depends on many other factors (Lo, 2008b), for example accountants are fastidiously following the poor standards leads to low quality of reported earnings. Normally there are two definitions of earning quality, first definition is the sustainability of earnings, but this definition is predominantly based on linkage of upward managed earnings leads to low earning quality thus discounting the concept of downward managed earnings (Ball & Shivakumar, 2008), while second definition is unbiasedness or neutrality of the earnings and accounting policies and estimates to generate earnings. The latter differ from the approach of Ball and Shivakumar (2008). The present study addresses the earning quality measure on the argument based on second definition because this study sample has contrasting accounting policies and practices so it is pertinent to predict the changes in market value due to factors of earning quality other than earning management. Moreover, the present study also addresses the downward managed earnings linkage with earning quality which is not addressed in prior literature and that need to be predicted.

Hypothesis H4. The earning informativeness or pricing of earnings in market is not a function of earning quality in South Asian countries.

Accrual quality is defined as the variation the accruals, it is also referred to as information risk measure. Literature suggested that, the information risk is non-diversifiable risk (Easley & O'hara, 2004; O'Hara, 2003) and one of the proxy of information risk is accrual quality (Du, 2019; Francis et al., 2005; Slack et al., 2010). After the emergence of accrual quality as the measure of information risk, variety of studies have been conducted on impact of accrual quality on market value fundamentals, that are earnings, stock returns, securities mispricing, informed trading patterns, and meeting analyst forecast that effect market value. The impact of accrual quality on expected stock returns has been tested in accounting literature (Core et al., 2008; Francis et al., 2005; Kim & Qi, 2010; Mashruwala & Mashruwala, 2011;

Ogneva, 2012). Previous studies also identified the relevancy of accrual quality towards stock returns expectations (Richardson et al., 2006; Sloan, 1996). Core et al. (2008) and Mouselli et al. (2013) extended the relationship of accrual quality and stock returns and depicted no evidence that accrual quality is the priced risk factor. On the contrary, Francis et al. (2005) confirmed the accrual quality factor as priced risk factor. Mouselli et al. (2012) concluded the insignificance of accrual quality factor as priced risk factor. The accrual quality is actually based on volatility of accruals (Core et al., 2008; Mouselli et al., 2013; Richardson et al., 2006; Sloan, 1996). Higher the volatility of accruals lower will be the accruals quality and how the accrual quality effects market value need to be predicted.

Hypothesis H5. The earning informativeness or pricing of earnings in market is not a function of accrual quality in South Asian countries.

In the context of previous studies related to accruals as measure of earning management, earning quality, and accrual quality, the major gap is identified in term of how these descriptive characteristics of earnings effect the earning informativeness that ultimately effects market value. As the Asian market are more prone to earning management due to weaker investor protection, so studying the earning informativeness changes due to descriptive characteristics of earnings in member countries of APTA has important implication to existing body of knowledge. Prior studies are mostly focus on the discretionary accruals as measure of earning management and its impact on different fundamentals of business other than earning, and have least focus on non-discretionary accruals and its impact on earning informativeness. The present study also incorporates non-discretionary accruals and variation in cash flow as control variable.

3 | RESEARCH METHODS

As discussed in previous section, it is documented that earnings are incrementally informative to cash flow from operations (Bowen, Burgstahler, & Daley, 1987; Dechow, 1994). Subramanyam (1996) identified that discretionary accruals are used to remove earning fluctuation. Thus, the modelling of market adjustable and earning management directly examine the impact of earning smoothing on pricing of earning. For this purpose, the relationship of earning smoothing with multiples of earning is studied. The simple model used to assess the earning informativeness is as under:

$$MVE_{it} = \alpha + \beta(NI)_{it} + \mu_{it} \quad (1)$$

For the purpose of examining the implications of earning management that leads to earning persistence on firm value, the coefficient of Equation (1) is modelled as the indicator of earning informative efficiency or informativeness for this study. The reason indicating the coefficient of earnings as the indicator of informativeness is due to latent¹² nature of earning informativeness.

$$\beta = \beta_1 + \beta_2(\sigma CFO)_{it} + \beta_2(ICFONDA)_{it} + \beta_3(IEDA)_{it} + \beta_3(EQ)_{it} + \beta_4(AQ)_{it} + \nu_{it} \quad (2)$$

where ICFONDA and IEDA are the two incremental effects of non-discretionary and discretionary accruals, accrual quality (AQ) and earning quality (EQ) are two quality factors that have impact on earning informativeness. Putting Equation (2) in Equation (1) that results

$$MVE_{it} = \alpha + \beta_1(NI)_{it} + \beta_2(NI)_{it}(\sigma CFO)_{it} + \beta_3(NI)_{it}(ICFONDA)_{it} + \beta_4(NI)_{it}(IEDA)_{it} + \beta_5(NI)_{it}(EQ)_{it} + \beta_6(NI)_{it}(AQ)_{it} + \varepsilon_{it} \quad (3)$$

where, MVE = Market value of the firm i at time t , NI = Net income of the firm i at time t , σCFO = standard deviation of Cash flow measured by GARCH (1, 1) series of the firm i at time t , ICFONDA = Incremental effect of cash flow volatility of non-discretionary accruals measured by binary variable of the firm i at time t , IEDA = Incremental effect of earnings volatility of discretionary accruals measured by binary variable of the firm i at time t , EQ = Earning Quality, measured by binary variable, of the firm i at time t , AQ = Accrual Quality, measured by binary variable, of the firm i at time t .

Differentiating Equation (3) with respect to NI

$$\frac{\partial MVE}{\partial NI} = \beta_1 + \beta_2 \sigma CFO$$

If β_2 is significant and positive than marginal effect of net income (NI) on MVE rises in presence of σCFO and vice versa. Reverting to Equation (3)

$$MVE_{it} = \alpha + \beta_1(NI)_{it} + \beta_2(NI)_{it}(\sigma CFO)_{it} + \beta_3(NI)_{it}(ICFONDA)_{it} + \beta_4(NI)_{it}(IEDA)_{it} + \beta_5(NI)_{it}(EQ)_{it} + \beta_6(NI)_{it}(AQ)_{it} + \varepsilon_{it}$$

If dummy structure of earning management and earning quality variables equal to 1 then

$$MVE_{it} = \alpha + \beta_1(NI)_{it} + \beta_2(NI)_{it}(\sigma CFO)_{it} + \beta_3(NI)_{it} + \beta_4(NI)_{it} + \beta_5(NI)_{it} + \beta_6(NI)_{it} + \varepsilon_{it}$$

$$MVE_{it} = \alpha + (\beta_1 + \beta_3 + \beta_4 + \beta_5 + \beta_6)(NI)_{it} + \beta_2(NI)_{it}(\sigma CFO)_{it} + \varepsilon_{it}$$

So from above equation, the comparative coefficients are

$$\beta_1 \approx \beta_3$$

$$\beta_1 \approx \beta_4$$

$$\beta_1 \approx \beta_5$$

$$\beta_1 \approx \beta_6$$

The informative coefficients are compared with the NI coefficient to identify the informativeness significance. The informative coefficients significance point towards the impact of informative coefficient impact on relationship of market value of equity and net income. If there is a positive informative coefficient then positive structural change in relationship of market value of equity and net income will be seen. The negative significance brings reduced structural change in aforementioned relationship. The insignificance leads to the non-informative behaviour of the variable. The present study calculated the market value by multiplying the outstanding share with year-end share price of the firm. The Earnings after taxes (EAT) is used as a net income for the analysis of the model because taxes also play vital role in managing earnings.

Methodologically, present study employs one of the efficient models such as panel data model along with redundancy test in order to address the cross-section heterogeneity. Findings of such model have important implication about the sensitivity of earning and market value towards changes in descriptive characteristics of earnings.

3.1 | Panel data model

In order to overcome the problem of heteroskedasticity, weighted least square is used that assign equal weight to each observation leads to spurious results. Weighted least square attempts to address this unequal variability by assigning specific weight to each observation For

Weighted least square, the regression is transformed as follow

$$\begin{aligned} \frac{MVE_{it}}{\sigma_{it}} = & \alpha \left(\frac{1}{\sigma_{it}} \right) + \beta_1 \left(\frac{NI_{it}}{\sigma_{it}} \right) + \beta_2 \left(\frac{(NI)_{it}(\sigma CFO)_{it}}{\sigma_{it}} \right) \\ & + \beta_3 \left(\frac{(NI)_{it}(ICFONDA)_{it}}{\sigma_{it}} \right) + \beta_4 \left(\frac{(NI)_{it}(IEDA)_{it}}{\sigma_{it}} \right) \\ & + \beta_5 \left(\frac{(NI)_{it}(EQ)_{it}}{\sigma_{it}} \right) + \beta_6 \left(\frac{(NI)_{it}(AQ)_{it}}{\sigma_{it}} \right) + \frac{\varepsilon_{it}}{\sigma_{it}} \end{aligned} \quad (4)$$

In this equation the effect of heteroskedastic variances σ^2 of each panel is sliced through transformation of the equation. Further simplification specifies the Equation (3).

$$\sum \left(\frac{\varepsilon_{it}}{\sigma_{it}} \right)^2 = \sum \left(\begin{aligned} & \frac{MVE_{it}}{\sigma_{it}} - \alpha \left(\frac{1}{\sigma_{it}} \right) - \beta_1 \left(\frac{NI_{it}}{\sigma_{it}} \right) - \beta_2 \left(\frac{(NI)_{it}(\sigma CFO)_{it}}{\sigma_{it}} \right) - \beta_3 \left(\frac{(NI)_{it}(ICFONDA)_{it}}{\sigma_{it}} \right) \\ & - \beta_4 \left(\frac{(NI)_{it}(IEDA)_{it}}{\sigma_{it}} \right) - \beta_5 \left(\frac{(NI)_{it}(EQ)_{it}}{\sigma_{it}} \right) - \beta_6 \left(\frac{(NI)_{it}(AQ)_{it}}{\sigma_{it}} \right) \end{aligned} \right)^2$$

Parameters can be obtained through minimization of the above equation. For incorporating the cross section and time period heterogeneity LSDV are constructed that are

The cross section LSDV can be represented as

$$\begin{aligned} MVE_{it} = & \alpha_1 + D_{2i}\delta_2 + D_{3i}\delta_3 + \dots\dots\dots D_{ni}\delta_n + \beta_1(NI)_{it} \\ & + \beta_2(NI)_{it}(\sigma CFO)_{it} + \beta_3(NI)_{it}(ICFONDA)_{it} \\ & + \beta_4(NI)_{it}(IEDA)_{it} + \beta_5(NI)_{it}(EQ)_{it} \\ & + \beta_6(NI)_{it}(AQ)_{it} + \varepsilon_{it} \end{aligned} \quad (5)$$

The time period LSDV can be represented as

$$\begin{aligned} MVE_{it} = & \alpha_1 + T_{2i}\gamma_2 + T_{3i}\gamma_3 + \dots\dots\dots T_{3i}\gamma_n + \beta_1(NI)_{it} \\ & + \beta_2(NI)_{it}(\sigma CFO)_{it} + \beta_3(NI)_{it}(ICFONDA)_{it} \\ & + \beta_4(NI)_{it}(IEDA)_{it} + \beta_5(NI)_{it}(EQ)_{it} \\ & + \beta_6(NI)_{it}(AQ)_{it} + \varepsilon_{it} \end{aligned} \quad (6)$$

The cross section and time period LSDV can be represented as

$$\begin{aligned} MVE_{it} = & \alpha_1 + D_{2i}\delta_2 + D_{3i}\delta_3 + \dots\dots\dots D_{ni}\delta_n + T_{2i}\gamma_2 \\ & + T_{3i}\gamma_3 + \dots\dots\dots T_{3i}\gamma_n + \beta_1(NI)_{it} \\ & + \beta_2(NI)_{it}(\sigma CFO)_{it} + \beta_3(NI)_{it}(ICFONDA)_{it} \quad (7) \\ & + \beta_4(NI)_{it}(IEDA)_{it} + \beta_5(NI)_{it}(EQ)_{it} \\ & + \beta_6(NI)_{it}(AQ)_{it} + \varepsilon_{it} \end{aligned}$$

Due to large number of cross section, complexity and heteroscedasticity issue, fixed effect model is estimated through transformed entity demeaned estimators. So from Equations (3) and (7)

$$\begin{aligned} \tilde{MVE}_{it} = & \alpha + \beta_1 \tilde{(NI)}_{it} + \beta_2 \tilde{(NI)}_{it} \tilde{(\sigma CFO)}_{it} \\ & + \beta_3 \tilde{(NI)}_{it} \tilde{(ICFONDA)}_{it} + \beta_4 \tilde{(NI)}_{it} \tilde{(IEDA)}_{it} \\ & + \beta_5 \tilde{(NI)}_{it} \tilde{(EQ)}_{it} + \beta_6 \tilde{(NI)}_{it} \tilde{(AQ)}_{it} + \varepsilon_{it} \end{aligned} \quad (8)$$

The cross-section heterogeneity can be addressed through error term, depicting randomness of the cross section.

$$\begin{aligned} MVE_{it} = & \alpha_1 + v_i + \beta_1(NI)_{it} + \beta_2(NI)_{it}(\sigma CFO)_{it} \\ & + \beta_3(NI)_{it}(ICFONDA)_{it} + \beta_4(NI)_{it}(IEDA)_{it} \\ & + \beta_5(NI)_{it}(EQ)_{it} + \beta_6(NI)_{it}(AQ)_{it} + \varepsilon_{it} \end{aligned}$$

where $\varepsilon_{it} = \mu_{it} + v_i$, Then

$$\begin{aligned} MVE_{it} = & \alpha_1 + \beta_1(NI)_{it} + \beta_2(NI)_{it}(\sigma CFO)_{it} \\ & + \beta_3(NI)_{it}(ICFONDA)_{it} + \beta_4(NI)_{it}(IEDA)_{it} \quad (9) \\ & + \beta_5(NI)_{it}(EQ)_{it} + \beta_6(NI)_{it}(AQ)_{it} + \varepsilon_{it} \end{aligned}$$

3.2 | Discretionary and non-discretionary accruals

Earning management can be achieved through various methods like accruals, changes in accounting standards and alterations in capital structure. However, this study

employs performance matched modified Jones model (Kothari et al., 2005) for the estimation of discretionary accruals as evidences strongly support performance measure adjustment as compared to other models adjustments. The model is;

$$TAC_{it} = \beta_0 + \beta_1(1/A_{it}) + \beta_2(\Delta Revenue - \Delta Accruevenue)/A_{it} + \beta_2(PPE_{it}/A_{it}) + \beta_3ROA_{it} + v_{it}$$

The present study assesses the effect of discretionary accruals smoothing on earning multiplier that ultimately test the pricing effect of earning smoothing. This rationale is known as informativeness hypothesis. Higher multiplier is associated with increased earnings informativeness (Chaney & Lewis, 1995; Ronen & Sadan, 1981; Watts & Zimmerman, 1986). With the purpose of testing informativeness hypothesis the incremental effects of accruals component on earning multiplier is studied. The discretionary and non-discretionary accruals, calculated from the above model, is used for the development of the four independent variables that are incremental effect of cash flow, volatility of non-discretionary accruals (ICFONDA) and incremental effect of earnings, volatility of discretionary accruals (IEDA), Earning Quality (EQ) and Accrual Quality (AQ).

The incremental effect of cash flow, volatility of non-discretionary accruals (ICFONDA) and incremental effect of earnings, volatility of discretionary accruals (IEDA) are indicators of earning smoothing that brings information content to earnings. The present study adopts the approach suggested by Bhattacharya, Daouk, and Welker (2003); Cohen et al. (2004); Leuz, Nanda, and Wysocki (2003); Zarowin (2002), that is the ratio of standard deviation of non-discretionary net income to standard deviation of cash flow from operations, required for for earning smoothing indicator (Bhattacharya et al., 2003; Cohen et al., 2004; Leuz et al., 2003; Zarowin, 2002).

The GARCH (1, 1) variance series used as the measure of volatility or variation in present study. Prior studies used standard deviation as measure of volatility without considering that standard deviation follow normal distribution. The purpose of using GARCH (1, 1) series is that it places no restriction on distribution of error. Moreover, the variance of lead error may be related to past variance, which is addressed by GARCH series without violating the rational expectation (Cuthbertson & Nitzsche, 2005).

3.3 | Volatility of cash flow from operations

The purpose of inclusion of cash flow volatility is to control for cross sectional differences in volatility of earnings

arising from cash flow. In this study, the focus is on earning smoothing through accrual accounting, thereby controlling the cash flow discretions. Volatility of Cash flow is represented by $\sigma(CFO)$ that is the standard deviation of cash flow for which GARCH (1, 1) variance series will be employed as the proxy of cash flow risk.

3.4 | Incremental effect of cash flow, volatility of non-discretionary accruals (ICFONDA)

The incremental effect of cash flow volatility of non-discretionary accruals is identified as the dummy variable. The effect on operating cash flow volatility of using nondiscretionary accrual accounting practices is measured using the approach of Bhattacharya et al. (2003); Cohen et al. (2004); Leuz et al. (2003); Zarowin (2002) that is, the ratio of the variance of nondiscretionary net income to the variance of operating cash flows. $\sigma(NDNI)/\sigma(CFO) = 1$ If < industry median otherwise 0, where NDNI (Dechow et al., 1995; Jones, 1991) is the CFO plus NDA. In other words, this variable identifies the efficient and opportunistic earning management from non-discretionary accruals. The variances are measured through GARCH (1, 1) variance series. The above ratio is said to be accrual accounting ratio as it is based on inherited accounting process without any discretionary power and it is defined as larger, if non-discretionary accrual increases the variation and does not contribute in decreasing the volatility, whereas smaller means that non-discretionary accruals performs earning smoothing. This ratio approach is also used¹³ as the measure of the non-discretionary effect towards increasing or reducing earnings variations (Dechow et al., 1995; Jones, 1991).

3.5 | Incremental effect of earnings, volatility of discretionary accruals (IEDA)

The incremental effect of earnings, volatility of discretionary accruals is also used as dummy variables. The effect of discretionary accruals on volatility of earnings is measured using the approach Barton (2001); Pincus and Rajgopal (2002); Ronen and Yaari (2008) as the ratio of standard deviation of net income and non-discretionary net income. $\sigma NI/\sigma NDNI = 1$ If < industry median otherwise zero. This variable is also based on the purpose of identifying efficient and opportunistic earning management. The standard deviation that are incorporated is based on GARCH (1, 1) variance series. The above ratio is known as management ratio as it shows the smoothing and variations based on managers' discretion and is

defined as larger ratio identifies that discretionary accruals does not contributes to the earning smoothing. This ratio is the earning management ratio as it identify the discretionary accruals purpose as either opportunistic or efficient (Dechow et al., 1996; Jones, 1991).

3.6 | Earning quality (EQ)

The earning quality can be evaluated by focusing on persistence of earning; high quality earnings shows increased persistency and information content (Lev, 1989). There are three basic approaches to measure earning quality. The first approach is based on the variability of earnings with the idea that managers tends to smooth earnings for investor attraction (Leuz et al., 2003), which is approach is already addressed in this study in accrual quality variable which is based on volatility of accruals. The second approach is ratio of cash flow form operation to net income (Penman, 2007), which is also addressed in this study through IEDA measure of discretionary accruals. The third approach is based on the idea of earning surprise as reflected in the beginning balance of net operating assets relative to sales (Barton & Simko, 2002). This study employs Barton and Simko (2002) approach to measure the earning quality as this dimension earning management is not addressed in the model and earning surprise effects market value. According to this approach the quality of earning can be measured by dividing beginning balance of net operating assets by sales. The smaller the ratio the better would be the quality of the earnings. Through this approach, the classification of the firms can be done on the basis of quality and non-quality earnings. The dummy variable of earning quality is being developed that is, $NOA_{t-1}/Sales_t = 1$ if < industry median ratio and assumed as quality earnings and 0 otherwise and marked as non-quality earnings. The NOA is the net operating assets that include net current asset, long term assets and any other assets.

3.7 | Accrual quality (AQ)

The accrual quality depicts the information risk that ultimately effects earnings and market value. For the purpose of estimating accrual quality (AQ) the total current accruals are calculated based on the approach of Francis et al. (2005), Healy (1985), and Sloan (1996). The total current accrual is the sum of total Accruals at time t and Depreciation and amortization at time t . The current portion of modified Jones model (Dechow et al., 1995) for the estimation of accrual quality (Mouselli et al., 2012) is as under;

$$TAC_{it} = \beta_0 + \beta_1(1/A_{it}) + \beta_2(\Delta Revenue - \Delta Accrevenue) / A_{it} + v_{it}$$

The noise GARCH (1, 1) series is being generated that is employed in the model as Accrual Quality (AQ). For identifying the impact of accrual quality on earning informativeness the dummy variable is generated that is AQ =1 if < industry median value showing lesser information risk otherwise 0 for greater information risk.

4 | DATA

The sample is drawn from the five member countries of Asia Pacific Trade Agreement (APTA) that are China, India, Bangladesh, Sri Lanka, and Pakistan (Acceding member).¹⁴ These countries are representative of APTA in terms of economic growth potential and considered as emerging economies. Pakistan is also emerging economy and also acceding member of APTA, which has somewhat identical to representative countries of APTA. The APTA was signed in 1975 with the aim of promoting economic development and adoption of mutually beneficial trade liberalization. The size of APTA economies markets account for US\$14615.86 billion in terms of GDP, due to which the economies under APTA are considered as representative of Asia Pacific region. The non-financial firms listed in their respective country stock exchanges are taken in the sample that are Shanghai stock exchange (SSE), Bombay stock exchange (BSE), Dhaka Stock exchange (DSE), Colombo stock Exchange (CSE), and Karachi stock exchange (KSE). The data is taken from *Thomson Reuter DataStream Database* that possesses the data of all the listed companies of the respective stock exchanges. The non-financial firms, of which data from 2001 to 2018 (in case of Pakistan, India, and China) and data from 2007 to 2018 (in case of Sri Lanka and Bangladesh)¹⁵ is taken in the sample. Moreover, extreme outliers are also eliminated from the sample, which left with the sample of 802 firms that is taken in to consideration in which 173 companies are of India, 350 companies of China, 100 companies of Pakistan, 21 companies of Bangladesh and 158 companies of Sri Lanka. This sample results 9,173 company-year observations that are taken in to consideration for analysis.

The motivation for selecting APTA economies for this study lies in various folds. China has some unique corporate governance structure in China such as stock split structure, tradeable and non-tradeable shares, ownership structure and strong government control. It is interesting to examine the impact of earning management that is entailed through unique governance mechanism on

informativeness of accounting information. Moreover, Chinese government has promoted the international accounting convergence and reforms of market regulation towards international conventions in recent years. Thus, a study in the Chinese context generate some interesting evidence on the particular incentives and consequences of managers' informative earnings management on market value through managed earnings.

India and Pakistan are also included in the analysis as there is high demand for capital by companies from global market and foreign investors are demanding channelling this capital. Specifically, the importance of studying earning management and its impact on earning informativeness is vital for Pakistan due to recent international collaboration in terms of CPEC (China Pakistan Economic Corridor), which brings foreign institutional investors to Pakistan. Sustained flow of foreign capital can be fulfilled if investors are protected from accounting fraud, financial misconduct, and deceptive earning management. Sri Lanka and Bangladesh are on the progress of adoption of IFRS. So, it is interesting to study the changes in earning informativeness during the transition phase of accounting standards.

5 | EMPIRICAL ANALYSIS

Panel estimation results of China, India, Pakistan, Sri Lanka, and Bangladesh display the fixed effect and random effect models along with cross-section and time period variant. The cross section and time variant estimation for both effects are essential because of inconsistency among variables heterogeneities.

Tables 1 to 6 shows the panel estimated results China, India, Pakistan, Bangladesh, and Sri Lanka. Table 1 of China shows that the interaction term of net income and variations of cash flow (SDCFO) demonstrated period heterogeneity and relevance of error term and regressors, and is positively significant ($p < .05$), depicting that greater variations in cash flow boost the relationship of earning and market value, which is inconsistent with the notion that low variation in cash flow improve earning informativeness and cash flow (Dechow, 1994; Dimitropoulos et al., 2010; Haw et al., 2001) and consistent with notion of high profit efficiency related to higher risk (Berger & Patti, 2002). However, this notion is true for independent effect of variation in cash flow on market value. Similar pattern for India, Pakistan, and Sri Lanka is seen as in Tables 2, 4, and 6 with cross section and period heterogeneities. However, Bangladesh, as in Table 5, shows negative significance ($p < .05$) interaction term of net income and variations of cash flow (SDCFO) in cross section fixed effect, depicting

the presence of cross section heterogeneity. The negative significance suggest that, the marginal effect of NI on MVE reduces in presence of higher variation in cash flow, which is consistent with the notion that variation in cash flow reduces earning informativeness (Dechow, 1994; Dimitropoulos et al., 2010; Haw et al., 2001). However, the factor loadings in all countries is almost equal to zero showing negligible structural impact in market value, but substantial independent impact of SDCFO on market value is seen in redundancy test in all cases.

In case of China (Table 1), the interaction term of non-discretionary accrual (ICFONDA) and net income exhibits significant negative impact on market value, which depicts that marginal effect of net income on market value reduces in presence of non-discretionary accrual or it can be inferred that, smoothing induced by non-discretionary accrual reduces earning informativeness. However, the non-discretionary accrual is controlling factor that is not under the influence of manager's decisions. This result is contradictory to Ahmed, Godfrey, and Saleh (2008), which evidenced the irrelevancy of non-discretionary accruals and market value. Apart from China, in all other countries (Tables 2 to 6) the interaction of net income and non-discretionary accrual term is significant and positive ($p < .05$) either in EGLS or cross-section fixed effect or both, showing that the variable is time invariant and is related to error term. The positive sign shows that, keeping the earning constant, the firm with non-discretionary accrual term or accounting ratio below industry median have higher market value, than firm which are above median. The marginal effect of net income on MVE increases in presence of non-discretionary accrual term that is ICFONDA. These results are inconsistent with Ahmed et al. (2008), which confirmed the irrelevancy of non-discretionary accruals.

The interaction term of net income (NI) and discretionary accrual (IEDA) shows significance in all countries as shown in Tables 1 to 6. The interaction term of NI and IEDA shows negative significance ($p < .05$) in all countries except Bangladesh (see Table 4). In case of China the discretionary accrual term (IEDA) and Net income interaction is negatively significant ($p < .05$). The negative factor loading shows that firm with accrual management ratio below industry median has lower market value than firms, which are above median (Keeping Earning Constant). This result opportunistic behaviour of discretionary accruals that is more inclined to achieve agent's personal goals rather than organizational goals (Ronen & Yaari, 2008; Scott, 2000; Shan, 2015). In other words, the marginal effect of NI on MVE reduces in presence of discretionary accruals. Similarly, findings of India and Pakistan also showed negative significance in all effects. The negative significance suggests the opportunistic behaviour of

TABLE 1 Panel estimation of market valuation-China

Variables	EGLS	Cross-Section Fixed Effect	Cross-Section Random Effect	Period Fixed Effect	Period Random Effect	Cross-Section Time Period Fixed effect	Two Way Random Effect	Cross-Section Fixed Time Period Random Effect	Cross-Section Random period Fixed Effect
Constant	2,373.678[67.19] ^b	6,009.208[17.88] ^b	3,477.21[11.36] ^b	3,659.25 [28.24] ^b	3,502.807 [5.1] ^b	5,500.365[17.37] ^b	3,503.522 [4.82] ^b	5,476.66[17.3] ^b	3,509.475[11.61] ^b
NI	8.939[11.87] ^b	4.234[6.86] ^b	18.2812[40.18] ^b	20.042 [95.98] ^b	18.2778 [38.45] ^b	7.8851[12.3] ^b	18.2777 [38.43] ^b	7.93[12.37] ^b	18.277[40.7] ^b
NI(SDCFO)	0.00E+00[0.94]	0.00E+00[-1.3]	-0.0001[-24.16] ^b	0.00E+00 [-30.01] ^b	-0.0001 [-23.05] ^b	-1.00E-04[-20.36] ^b	-0.0001 [-23.04] ^b	0.00E+00[-20.41] ^b	-0.0001[-24.38] ^b
NI(ICFONDA)	2.626[3.84] ^b	0.965[1.8]	-6.1069[-14.12] ^b	-5.639 [-22.95] ^b	-6.1638 [-13.61] ^b	-2.6905[-4.8] ^b	-6.1654 [-13.61] ^b	-2.66[-4.75] ^b	-6.1787[-14.43] ^b
NI(IEDA)	-1.268[-1.8]	-0.867[-1.59]	-2.2137[-8.54] ^b	-1.423 [-9.69] ^b	-2.2409 [-8.26] ^b	-2.6927[-10.34] ^b	-2.2417 [-8.26] ^b	-2.68[-10.3] ^b	-2.248[-8.77] ^b
NI(EQ)	1.827[5.13] ^b	5.548[15.42] ^b	2.2802[5.2] ^b	-2.752 [-13.25] ^b	2.2599[4.93] ^b	7.107[13.97] ^b	2.2593[4.93] ^b	7.1[13.96] ^b	2.2545[5.21] ^b
NI(AQ)	-0.123[-0.3]	-0.11[-0.34]	0.3022[0.26]	1.367 [2.17] ^a	0.1197[0.1]	-0.2555[-0.21]	0.1146[0.09]	-0.17[-0.14]	0.0721[0.06]
R-Square	0.47	0.64	0.77	0.91	0.77	0.82	0.77	0.81	0.78
SE of Regression	17,437.03	19,526.26	20,960.56	18,555.59	20,796.14	19,632.41	20,791.56	19,658.84	20,781.02
F-Statistics	660.66 ^b	21.08 ^b	2,565.59 ^b	2,540.39 ^b	2,593.44 ^b	50.53 ^b	2,594.23 ^b	51.54 ^b	875.09 ^b
Durbin Watson Stat	1.18	1.47	1.41	1.02	1.4	1.62	1.4	1.62	1.4
Redundancy Test									
SDCFO	Redundant	Redundant	—	—	—	—	—	—	—
AQ	—	—	—	—	—	Redundant	—	Redundant	—
IEDA	—	Redundant	—	—	—	—	—	—	—

Note: The table shows the results of model that explains impact of accruals and quality measures on market value. The fixed and random effect results along with redundancy test results are shown in this table. The EGLS shows pooled results with cross section weights.

Note: Values in [—] shows the t-statistics.

Note: Dependent Variable is Market value of Equity, Balanced Panels estimation, Robustness tested with Swamy and Arora estimator of component variances, Redundancy tested to segregate structural and independent effects.

^aNote: Significant at 5% level.

^bNote: Significant at 1% level.

TABLE 2 Panel estimation of market valuation-India

Variables	EGLS	Cross-Section		Period		Cross-Section Time		Two Way		Cross-Section Fixed		Cross-Section	
		Fixed Effect	Random Effect	Fixed Effect	Random Effect	Period Fixed effect	Time Period Random Effect	Random Effect	Time Period Random Effect	Time Period Random Effect	Random Effect	Time Period Random Effect	Random Effect
Constant	43,545.55 [17.76] ^b	230,712.8 [24.87] ^b	125,332.3[2.63] ^b	206,177.7 [14.46] ^b	106,233.4 [4.2] ^b	150,575.8[7.06] ^b	131,731.1 [2.61] ^b	128,326.1[6.11] ^b	151,044[7.28] ^b	128,326.1[6.11] ^b	131,731.1 [2.61] ^b	128,326.1[6.11] ^b	151,044[7.28] ^b
NI	31.1196[12.04] ^b	23.4286[12.37] ^b	61.5475[14.36] ^b	30.1318 [7.52] ^b	64.9485 [13.26] ^b	57.506[12.98] ^b	60.4545[13.8] ^b	61.4309[14.03] ^b	57.156[13.38] ^b	61.4309[14.03] ^b	60.4545[13.8] ^b	61.4309[14.03] ^b	57.156[13.38] ^b
NI(SDCFO)	0.00E+00[2.01] ^a	1.00E-04[4.2] ^b	0.0002[13.94] ^b	1.00E-04 [4.41] ^b	1.00E-04 [4.53] ^b	0.0002[16.56] ^b	0.0002[13.89] ^b	0.0002[16.12] ^b	0.0002[14.82] ^b	0.0002[16.12] ^b	0.0002[13.89] ^b	0.0002[16.12] ^b	0.0002[14.82] ^b
NI(ICFONDA)	7.0582[3.34] ^b	6.7222[4.68] ^b	-4.8078[-1.24]	5.8802 [1.54]	-1.522 [-0.34]	-2.898[-0.74]	-4.3826 [-1.11]	-4.2958[-1.1]	-3.1219[-0.82]	-4.2958[-1.1]	-4.3826 [-1.11]	-4.2958[-1.1]	-3.1219[-0.82]
NI(IEDA)	-1.8149[-0.88]	-4.3693 [-3.21] ^b	-33.8019 [-15.26] ^b	-7.8855 [-3.46] ^b	-28.2563 [-10.35] ^b	-36.5436[-16.52] ^b	-34.1058 [-15.1] ^b	-35.8474[-16.25] ^b	-34.8393[-15.92] ^b	-35.8474[-16.25] ^b	-34.1058 [-15.1] ^b	-35.8474[-16.25] ^b	-34.8393[-15.92] ^b
NI(EQ)	0.9941[0.54]	-2.0079[-1.59]	-16.1408 [-6.77] ^b	4.22[1.93]	-10.7977 [-4.3] ^b	-20.6423[-8.23] ^b	-16.4155 [-6.74] ^b	-20.2308[-8.1] ^b	-16.9449[-7.17] ^b	-20.2308[-8.1] ^b	-16.4155 [-6.74] ^b	-20.2308[-8.1] ^b	-16.9449[-7.17] ^b
NI(AQ)	-7.4671[-3.56] ^b	-5.2339 [-4.76] ^b	-18.6505 [-2.25] ^a	-13.5825 [-2.35] ^a	-21.8663 [-2.25] ^a	-24.9567[-2.98] ^b	-20.2255 [-2.39] ^a	-20.1975[-2.43] ^a	-25.0166[-3.04] ^b	-20.1975[-2.43] ^a	-20.2255 [-2.39] ^a	-20.1975[-2.43] ^a	-25.0166[-3.04] ^b
R-Square	0.4	0.75	0.53	0.51	0.59	0.79	0.53	0.78	0.55	0.78	0.53	0.78	0.55
SE of Regression	861,390.7	687,484.8	836,471.8	959,004.4	1,068,513	803,101.5	831,243.2	812,455.9	822,787.3	812,455.9	831,243.2	812,455.9	822,787.3
F-Statistics	245.61 ^b	34.1 ^b	429.75 ^b	129.23 ^b	528.8 ^b	39.62 ^b	421.79 ^b	40.47 ^b	151.7 ^b	40.47 ^b	421.79 ^b	40.47 ^b	151.7 ^b
Durbin Watson Stat	0.77	1.33	1.18	0.61	0.77	1.32	1.18	1.34	1.15	1.34	1.18	1.34	1.15
Redundancy Test													
IEDA	Redundant	—	—	—	—	—	—	—	—	—	—	—	—
EQ	Redundant	Redundant	—	Redundant	—	—	—	—	—	—	—	—	—
ICFONDA	—	—	Redundant	Redundant	Redundant	Redundant	Redundant	Redundant	Redundant	Redundant	Redundant	Redundant	Redundant

Note: The table shows the results of model that explains impact of accruals and quality measures on market value. The fixed and random effect results along with redundancy test results are shown in this table. The redundancy test is employed to study structural effect and independent effect.

Note: Values in [—] shows the t-statistics.

Note: Dependent Variable is Market value of Equity, Balanced Panels estimation, Robustness tested with Swamy and Arora estimator of component variances, Redundancy tested to segregate structural and independent effects.

^aNote: Significant at 5% level.

^bNote: Significant at 1% level.

TABLE 3 Earning informativeness sensitivities

China ¹⁸	India	Pakistan	Bangladesh	Sri Lanka
-4.8%	-6.3%	-12.58%	1.4%	-7.8%

Note: This table depicts the earning informativeness sensitivities towards earning management. The negative sign shows opportunistic behaviour of earning management.

earning management. Table 4 shows the results of Bangladesh, depicting the positive significance of interaction term of NI and IEDA in EGLS depicting the presence of heteroscedasticity, which suggest that in earning constancy, firms with accrual management ratio below industry median have greater market value than firms, which are above median. The marginal effect of NI on MVE increases in presence of discretionary accruals. This result represents the efficient behaviour of discretionary accruals (Lo, 2008a; Ronen & Yaari, 2008; Scott, 2000). The marginal effect of discretionary accruals on market value is calculated for all countries in Table 3.

From the marginal effects in Table 3, it is seen that among all countries in sample, the earnings informativeness of Pakistani firms are more sensitive to earning management as compared to other countries. The sensitivity analysis in Table 3 shows that except Bangladesh all countries opportunistically manage earning that has adverse effect on earning informativeness.

Table 2 also shows the results of redundancy test of India. The results show that non-discretionary accrual measure is redundant in all effects except cross-section fixed and EGLS, depicting that non-discretionary accruals measure is redundant in period effects and random effects, concluding the absence of period heterogeneities. The interaction term of net income and earning quality shows significance in all countries. The results of India, Pakistan, and Bangladesh in Tables 2, 3, and 4 shows negative significance ($p < .05$) in period random effects which shows that error term based on period effect is independent of regressor. The negative significance of EQ concludes that firms with earning surprise indicator lower than industry median have lower market value than firms which are above median, while keeping the earnings constant. This result is inconsistent to Barton and Simko (2002), which evidenced that, firm with large beginning balance of operating assets relative to sales are less inclined to report earnings surprise. This significance infers that overstatement of net operating assets, with the purpose of restricting managers to report biased earnings, have negative structural impact on market value and reduces the earning informativeness towards market value. The results show that over statement of net operating assets relative to sales does not improve market value

rather reduces the earning informativeness. The investor measurement of return on asset (ROA) becomes unfavourable measure due to overstated net operating assets, which leads to reduction in market value. So, the marginal effect of NI on MVE decreases with earning quality driven by earning surprise (ElMoatasem Abdelghany, 2005).

In case of China and Sri Lanka, EQ and NI interaction is positively significant ($p < .05$) in cross section and time fixed effects, suggesting that, keeping earnings constant, the firms with earning surprise indicator below industry median have greater market value than firms which are above median. The marginal effect of NI on MVE improves in presence of EQ, consistent with prior studies (Barton & Simko, 2002; ElMoatasem Abdelghany, 2005).

The interaction term of net income and accrual quality is significant ($p < .05$) in all countries. China and Pakistan shows positive significance of interaction term of NI and AQ in period effect, as shown in Tables 1 and 4. The positive significance ($p < .05$) of accrual quality and net income interaction term shows that firms having variation in current accruals below industry median have greater market value than firms, which are above median. This positive significance implies that, marginal effect of net income on MVE increases in presence of accrual quality. Dechow and Dichev (2002); Francis et al. (2005); McNichols (2002) also reported the same behaviour of accrual quality as identified in this study.

Tables 2, 3, and 4 also show the redundancy results. The results Pakistan and Bangladesh show that the measures of accruals quality and non-discretionary accrual are redundant in period effects and random effects, showing the absence of period heterogeneities and random effects. In case of Bangladesh the model becomes redundant in random effect.

India and Sri Lanka show negative significance ($p < .05$) of NI and AQ interaction term comprehend that firms with variations in accruals below industry median have lower market value than firms with current accrual variations above industry median or greater information risk (keeping earning constant). This result concludes that, the marginal effect of NI on MVE decreases with higher current accrual quality or it can be resulted that, higher current accrual quality reduces earning informativeness. The reason behind this result is consistent with heterogeneity among the firms regarding discretionary accruals (Guay, Kothari, & Watts, 1996; Subramanyam, 1996). Prior researches¹⁶ documented that, how managers in some time period uses accounting discretion to reduce accrual quality. For example, managers who are furnished with stock options have the incentives for increasing volatility during the expected tenure of the options, which leads to increase option value due to

TABLE 4 Panel estimation of market valuation-Pakistan

Variables	EGLS	Cross-Section Fixed Effect	Cross-Section Random Effect	Period Fixed Effect	Period Random Effect	Cross-Section Time Period Fixed effect	Two Way Random Effect	Cross-Section Fixed Time Period Random Effect	Cross-Section Random Time period Fixed Effect
Constant	499.0899[12.06] ^b	5,598.425 [71.46] ^b	3,639.833 [2.62] ^b	2,510.008 [7.3] ^b	2,158.376 [3.18] ^b	4,380.775[8.72] ^b	3,742.692 [2.51] ^a	4,204.234[8.4] ^b	3,880.3[7.86] ^b
NI	4.72[10.17] ^b	1.8352[7.81] ^b	5.9645[3.91] ^b	6.9944 [4.21] ^b	5.7996 [2.83] ^b	4.7823[3.1] ^b	5.7449[3.67] ^b	5.1749[3.38] ^b	5.4372[3.58] ^b
NI(SDCFO)	0.00E+00[-7.53] ^b	0.00E+00 [-5.88] ^b	0.00E+00 [-3.95] ^b	0.00E+00 [-3.9] ^b	0.00E+00 [-5.01] ^b	0.00E+00[-2.55] ^a	0.00E+00 [-3.65] ^b	0.00E+00[-2.91] ^b	0.00E+00[-3.48] ^b
NI (ICFONDA)	1.1471[2.7] ^b	0.8439[3.86] ^b	1.556[1.07]	-0.1673 [-0.11]	2.8208 [1.39]	1.4536[1]	1.5303[1.02]	1.4813[1.02]	1.4957[1.03]
NI(IEDA)	-4.0085[-14.76] ^b	-1.1125 [-5.56] ^b	-4.2293 [-9.84] ^b	-4.9346 [-7.28] ^b	-5.2685 [-9.26] ^b	-3.5111[-7.98] ^b	-4.1113 [-9.3] ^b	-3.708[-8.5] ^b	-3.9504[-9.18] ^b
NI(EQ)	0.9576[3.94] ^b	0.2208[1.41]	-1.2173 [-2.86] ^b	1.4068 [2.37] ^a	-0.001[0]	-1.2663[-2.96] ^b	-1.1788 [-2.7] ^b	-1.3356[-3.13] ^b	-1.1176[-2.65] ^b
NI(AQ)	0.3765[1]	-0.3011 [-1.55]	-0.0689[-0.09]	4.3901 [6.73] ^b	4.4052 [4.36] ^b	-0.6693[-0.91]	-0.0077 [-0.01]	-0.7711[-1.05]	0.1059[0.14]
R-Square	0.58	0.7	0.18	0.43	0.3	0.7	0.17	0.69	0.2
SE of Regression	13,646.61	12,874.68	16,547.69	23,131.43	23,247.09	15,871.26	16,432.5	15,952.36	16,378.58
F-Statistics	292.98 ^b	26.2 ^b	47.65 ^b	52.81 ^b	93.4 ^b	23.88 ^b	44.32 ^b	25.75 ^b	18.04 ^b
Durbin Watson Stat	1.29	1.63	0.94	0.7	0.77	0.9	0.93	0.93	0.9
Redundancy Test									
AQ	Redundant	Redundant	Redundant	—	—	Redundant	Redundant	Redundant	Redundant
EQ	—	Redundant	—	—	—	—	—	—	—
ICFONDA	—	—	Redundant	—	—	Redundant	Redundant	Redundant	Redundant

Note: The table shows the results of model that explains impact of accruals and quality measures on market value. The fixed and random effect results along with redundancy test results are shown in this table. The redundancy test is employed to study structural effect and independent effect.

Note: Values in [—] shows the t-statistics.

Note: Dependent Variable is Market value of Equity, Balanced Panels estimation, Robustness tested with Swamy and Arora estimator of component variances, Redundancy tested to segregate structural and independent effects.

^aNote: Significant at 5% level.

^bNote: Significant at 1% level.

TABLE 5 Panel estimation of market valuation-Bangladesh

Variables	EGLS	Cross-Section Fixed Effect	Cross-Section Random Effect	Period Fixed Effect	Cross-Section Time Period Fixed effect	Cross-Section Random Time period Fixed Effect
Constant	21,853.03[2.67] ^b	135,542.2[6.09] ^{b>}	55,053.31[2.59] ^a	48,684.6 [2.53] ^a	243,514.7[8.46] ^{b>}	63,653.78[3.3] ^{b>}
NI	48.915[2.3] ^a	96.469[4.28] ^{b>}	80.9005[2.45] ^a	98.986 [2.81] ^{b>}	-3.081[-0.08]	61.786[1.94]
NI(SDCFO)	0.004[1.59]	-0.004[-2.32] ^a	0.0003[0.4]	0.002 [2.77] ^{b>}	-0.002[-1.48]	0.00E+00[0.08]
NI (ICFONDA)	29.69[2.38] ^a	19.921[1.71]	49.8524[1.82]	-12.072 [-0.42]	33.665[1.19]	66.823[2.59] ^a
NI(IEDA)	31.294[2.37] ^a	2.092[0.19]	37.7718[4.1] ^{b>}	52.406 [6.61] ^{b>}	-9.534[-0.94]	37.753[4.4] ^{b>}
NI(EQ)	-40.499[-3.79] ^{b>}	-19.429[-1.96]	-66.5464[-5.58] ^{b>}	-36.032 [-3.15] ^{b>}	-3.64[-0.29]	-61.74[-5.54] ^{b>}
NI(AQ)	28.839[2.4] ^a	29.914[2.77] ^{b>}	-2.3612[-0.11]	14.231[0.86]	15.07[0.68]	6.2[0.32]
R-Square	0.65	0.909	0.72	0.95	0.97	0.69
SE of Regression	224,900	115,737	259,385.8	222,730.1	111,044.6	252,950
F-Statistics	29.818 ^{b>}	30.125 ^{b>}	42.75 ^{b>}	181.73 ^{b>}	80.62 ^{b>}	21.13 ^{b>}
Durbin Watson Stat	1.318	2.145	2.27	1.8	2.4	2.23
Redundancy Test						
SDCFO	Redundant	—	—	—	—	—
IEDA	—	Redundant	—	—	Redundant	—
ICFONDA	—	—	Redundant	Redundant	Redundant	Redundant
AQ	—	—	Redundant	Redundant	Redundant	Redundant
EQ	—	—	—	—	Redundant	—

Note: The table shows the results of model that explains impact of accruals and quality measures on market value. The fixed and random effect results along with redundancy test results are shown in this table. The redundancy test is employed to study structural effect and independent effect.

Note: Values in [—] shows the t-statistics.

Note: Dependent Variable is Market value of Equity, Balanced Panels estimation, Robustness tested with Swamy and Arora estimator of component variances, Redundancy tested to segregate structural and independent effects.

^aNote: Significant at 5% level.

^bNote: Significant at 1% level.

induced hedging requirements. The stock option prevalence motivates the manager, acts in a way to increase cost of capital (which is in line of volatility of returns). So, this manipulation in accrual quality reduces the earning informativeness and refers to opportunistic earning management driven by manipulating the accrual variations that effects accrual quality. In case of India, accrual quality is maintained for fulfilling personal objectives, but this manipulation is not captured by market, due to its private nature (Easley & O'hara, 2004; O'Hara, 2003).

The redundancy of the all the interaction variables are also tested along with panel estimations in Tables 1 to 6. The results depicted that there are no constant

redundant variables in all the effects of all countries that is the redundant variable changes with the effect, which infers that the insignificance of variables in any effect is because of heterogeneities rather than redundancy, confirming the impact of all the variables.

Table 7 shows the result of Hausman test and redundant fixed effect test of all the countries under consideration. In case of China, he Hausman test confirms the efficiency of cross section fixed and period fixed effect over random effect. The redundant fixed effect test shows that the intercepts in cross-section and time period fixed are not equal to zero. So, cross-section fixed and time period fixed effect are efficient. It is also seen that AQ is

TABLE 6 Panel estimation of market valuation-Sri Lanka

Variables	EGLS	Cross-Section Fixed Effect	Cross-Section Random Effect	Period Fixed Effect	Cross-Section Time Period Fixed effect	Cross-Section Random Time period Fixed Effect
Constant	12,721.29[18.9] ^b	54,116.28 [42.22] ^b	43,514.82[3.86] ^b	33,490.4 [6.73] ^b	56,199.79[9.39] ^b	44,562.4[7.75] ^b
NI	0.099[0.01]	-10.2414[-1.9]	18.211[1.03]	73.33[8.29] ^b	-37.99[-2.06] ^a	21.073[1.2]
NI(SDCFO)	0.016[11.42] ^b	0.0083[7.02] ^b	0.008[4.69] ^b	0.01[6.85] ^b	0.014[6.98] ^b	0.009[4.88] ^b
NI(ICFONDA)	29.5[4.48] ^b	-0.2916[-0.1]	30.807[1.59]	50.66[4.72] ^b	-22.818[-1.09]	22.758[1.18]
NI(IEDA)	-14.862[-2.69] ^b	-17.9693 [-4.84] ^b	-74.957[-5.89] ^b	-56.5 [-4.79] ^b	-72.698[-5.47] ^b	-76.464[-6.04] ^b
NI(EQ)	2.447[0.43]	30.8018[6.39] ^b	26.861[1.92]	-78.47 [-7.16] ^b	101.446[5.99] ^b	27.914[2] ^a
NI(AQ)	-6.238[-0.84]	-7.8277[-2.61] ^b	-27.676[-1.65]	-97.2 [-7.51] ^b	-8.89[-0.53]	-28.605[-1.72]
R-Square	0.53	0.83	0.21	0.52	0.85	0.22
SE of Regression	159,613	114,676.1	172,592.8	243,897	140,012.3	171,242.3
F-Statistics	146.27 ^b	18.38 ^b	35.65 ^b	82.74 ^b	21.79 ^b	22.14 ^b
Durbin Watson Stat	0.97	1.7	1.19	0.88	1.81	1.19
Redundancy Test						
NI	Redundant	—	Redundant	—	—	—
AQ	Redundant	—	Redundant	—	Redundant	Redundant
ICFONDA	—	Redundant	Redundant	—	Redundant	Redundant
EQ	—	—	Redundant	—	—	—

Note: The table shows the results of model that explains impact of accruals and quality measures on market value. The fixed and random effect results along with redundancy test results are shown in this table. The redundancy test is employed to study structural effect and independent effect.

Note: Values in [—] shows the t-statistics.

Note: Dependent Variable is Market value of Equity, Balanced Panels estimation, Robustness tested with Swamy and Arora estimator of component variances, Redundancy tested to segregate structural and independent effects.

^aNote: Significant at 5% level.

^bNote: Significant at 1% level.

TABLE 7 Hausman test and redundant fixed effect test-China

Hausman Test					
Test Summary	China χ^2 Statistic	India χ^2 Statistic	Pakistan χ^2 Statistic	Bangladesh χ^2 Statistic	Sri Lanka χ^2 Statistic
Cross-section random	684.03 ^b	117.41 ^b	85.21 ^b	339.93 ^b	383.48 ^b
Period random	12.61 ^a	38.35 ^b	9.10	—	—
Redundant Fixed effect Test					
Test Summary	China Statistic	India Statistic	Pakistan Statistic	Bangladesh Statistic	Sri Lanka Statistic
Cross-section Fixed	9.24 ^b	15.00 ^b	10.37 ^b	4.78 ^b	11.07 ^b
Period Fixed	10.15 ^b	6.36 ^b	1.50	1.98	2.02

Note: The model under consideration in this test, for which fixed effect and random effect is compared, explains the impact of accruals and quality measures on market valuation. The results of Hausman test and redundant fixed effect test are shown in this table.

^aNote: Significant at 5% level.

^bNote: Significant at 1% Level.

not cross section variant but only time variant. In case of India, the Hausman test suggest the efficiency of cross section fixed effect and period fixed effect over random effect models. The redundant fixed effect test significance ($p < .05$) depicts that, cross section and time period intercepts in fixed effect are not equal to zero and that fixed effect results are different from pooled results. The Hausman test results of Pakistan specify the efficiency of cross section fixed effect and period random effect. The redundant fixed effect suggests effectiveness of cross section fixed effect, but depicts insignificance of period fixed effect showing similarity of period fixed effect and pooled results. The Hausman test of Bangladesh confirms the efficiency of cross section fixed effect over random effect. The period random effect does not exist and redundant fixed effect test supports cross section fixed effect. The redundant fixed effect test also infers that pooled results and period fixed results are similar in nature. In case of Sri Lanka, the Hausman test confirms the efficiency of cross section fixed effect and redundant fixed test identify the similarity of pooled results and period fixed effect results. So, cross section fixed effect and EGLS are most efficient among all effects. However, the net income variable is period fixed.

6 | CONCLUSION

The primary purpose of this study is to identify the role of accrual measures and quality measures in explaining the earning informativeness that effect market value of the firm through involving volatility factor in coefficient of earning. The analysis of each country identified certain unique behaviour of earning management and quality measures that effects information content of earnings towards market value.

The interaction term based on discretionary accruals concluded negative impact on earning informativeness in almost all countries except Bangladesh, which implies that, earning management is not performed for improving earnings market pricing, rather it is done for achieving manager's personal benefit. China also depicted opportunistic behaviour of earning management. The reason for such opportunistic behaviour could be the regulations of Chinese securities regulatory commission (CSRC), because Chinese governance often adapt accounting number to govern listed companies. The commission implement certain rules like maintenance of certain ROE for sustaining listing of the companies and issuing additional shares in the market. There is also ruling for delisting, if company reported loss in consecutive 3 years (Cheng, Aerts, & Jorissen, 2010). Such ruling motivates earning management practices that also provide room for managers to manage earning, sometimes

in favour of company, but mostly for personal benefit. The opportunistic behaviour of earning management is also detected in India and Pakistan.¹⁷ This can be attributed to GAAP rules, which allows for manager discretion. The migration to IFRS standards could reduce the managers' discretion, which is prevalent in GAAP rules.

The specific behaviour is seen in India and Sri Lanka in which the higher accrual quality reduces the market information content of earning. This behaviour is due to the fact the investors are uninformed and investors follow the prevailing momentum in the market (Guay et al., 1996; Subramanyam, 1996). In other words, this behaviour is due to information asymmetry. The result is consistent with Easley and O'hara (2004), that firm with more private information and less public information has high excess return. So, the private disclosure may improve accrual quality of which the investors are uninformed. In such case, investor continue to behave in accordance with publicly available information and accruals quality improvement or reduction, based on private information, is not depicted in market value. The earning quality also has negative influence on earning pricings in case of India and Bangladesh, which suggest that overstatement of beginning net operating assets have negative effect on earnings information content as this overstatement reduces returns on asset due to overstated denominator, rather it restricts managers from biased earnings. However, In other countries it works in a way suggested by Barton and Simko (2002). So, large economy with trade deficit and small economy with trade surplus reacts in same manner towards overstatement of net operating assets.

The market value measure of India has greater dependency on interaction term as compared to China and Pakistan due to lower price synchronicity. China also has greater influence of interaction term on its company's market values than Pakistan. In case of Bangladesh and Sri Lanka, the MVE of Sri Lankan firms is least effected by interaction terms. In overall, it can be inferred that firms of Asia Pacific representative economies opportunistically manage earnings that has adverse impact on informativeness or pricing of earnings in the market. This study also infers that higher the opportunistic earning management, lower is the informativeness of earnings, while making the earnings irrelevant. Such opportunistic behaviour leads to overstatement of vital balance sheet items such as Net operating assets, thus amplifying the adverse impact on earning information content in market through reduction of earning quality. Furthermore, it is also inferred that investors in these representative economies are uninformed due to firm non-disclosure of private information that also has adverse impact on earning informativeness. It is further seen that earning information content is highly sensitive to opportunistic earning management in Asian economies specifically in Pakistan and India.

This study has vital implications for the accounting standards as the extent of opportunities earning management is quite high in Asian economies. Such high degree of opportunistic earning management deters the international investors thus effect the foreign direct investment of and capital flow of the country. The economies which are on the verge of convergence of accounting standard should address opportunistic earning management as its consequences are not limited to fundamentals but also effect macroeconomic environment.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available in Data-stream International at <https://infobase.thomsonreuters.com/infobase/login/?next=/infobase/>.

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ENDNOTES

- ¹ For information content of earnings and earnings relevancy see literature of (Beaver, Clarke, & Wright, 1979)
- ² The earning persistency is related to low earning volatility.
- ³ See Literature of (Scott, 2000), (Burgstahler & Dichev, 1997a, 1997b), (Balsam, Bartov, & Marquardt, 2002)
- ⁴ Hepworth (1953) stated that owner of the firm will be more poised towards a company that report persistent earnings. Gordon (1964) suggested that management should smoothly reported income under the policy of GAAP, as the stakeholders' satisfaction increases with the growth and stability of its income. Ronen and Sadan (1981) identified that the reason behind earning smoothing is focused on management's desire to increase the value of the firm's stock. Moses (1987) implied that the cause and effect relationship between earnings fluctuations and market risk induces earning smoothing.
- ⁵ In his study Informativeness is termed as the Market pricing of Earnings
- ⁶ The term earning quality was introduced early in 1934 by Graham and Dodd in describing equity valuation as earning per share times "coefficient of quality" (Graham & Dodd, 1934)
- ⁷ By information risk, it means probability that firm-specific information that is relevant to pricing decision of investor is of poor quality. it is assumed that investor price the cash flow as primitive element and identify the accrual quality as the measure of information risk associated with relevant accounting number that is earnings. Accruals quality points the investors about the representing the accounting earnings into cash flows. Comparatively, poor accruals quality weakens this mapping and leads to increased information risk.
- ⁸ (Chen, Lin, Wang, & Wu, 2010; Iatridis & Kadorinis, 2009), (Li, Selover, & Stein, 2011), (Cormier, Houle, & Ledoux, 2013; Dai, Kong, & Wang, 2013), (Datta, Iskandar-Datta, & Singh, 2013)
- ⁹ (DeFond, 2010; Dichev, Graham, Harvey, & Rajgopal, 2013; Watrin & Ullmann, 2012), (Jenkins, Kane, & Velury, 2006; Kamarudin, Ismail, & Samsuddin, 2012), (Velury & Jenkins, 2006; Xu, Wang, & Anandarajan, 2012)

- ¹⁰ (Peng, 2011), (Richardson, Sloan, Soliman, & Tuna, 2006; Sloan, 1996), (Core, Guay, & Verdi, 2008; Francis et al., 2005; Mouselli, Jaafar, & Goddard, 2013; Mouselli, Jaafar, & Hussainey, 2012)
- ¹¹ Earning management concept is defined in various context. See (Dechow & Skinner, 2000; Healy & Wahlen, 1999; Schipper, 1989).
- ¹² The variables that are not directly observable or measurable
- ¹³ See literature of (Subramanyam, 1996)
- ¹⁴ The participating states are Bangladesh, India, China, Sri Lanka, Mongolia, and Lao PDR. However, for this study China, India, Bangladesh, Sri Lanka, and Pakistan (acceding member) is taken in to consideration as the major portion of GDP is derived from these economies.
- ¹⁵ Due to non-availability of data
- ¹⁶ Easley and O'hara (2004) has broadly resulted that firms with more private information and less public information have larger expected excess returns
- ¹⁷ Prior Studies also detected opportunistic earning management (Ronen & Yaari, 2008; Scott, 2000)
- ¹⁸ For China $MVE_{it} = \beta_1 + \beta_2(NI)_{it} + \beta_3(NI)_{it} (SDCFO)_{it}$
 $MVE_{it} = 230712.8 + 23.42 * 7016.06 + 0.0004 * 7016.06 * 30677.66 = 481,123.44$
 (The means value of the variable are taken from descriptive statistics. The marginal effect of all other countries is calculated in similar manner)

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