

Meeting and Beating Earnings Benchmarks: Evidence of Earnings Management in the form of Real Earnings Management (REM) and Accrual Earnings Management (AEM)

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***Abstract:** Extant research indicates that managers engage in earnings manipulation to manage reported earnings and value of the firm to maximize specific private benefits and to mislead some of firm's investors. This study examines whether the managers of Australian firms engage in earnings manipulation in the form of real earnings management (REM) and accrual earnings management (AEM) across the years they are meeting and/or beating earnings benchmarks in the form of earnings per share (EPS) and in the form of small changes in earnings per share (changes in EPS). These research questions are particularly relevant to Australia as a result of introduction of regulatory reform in Australia, which is Corporate Law Economic Reform Program (CLERP 9) to protect investors' interest after a series of high profile corporate collapses in Australia. Using a 4287 firm-year observations (excluding Financial and Utility Industry Sectors) over the 9 years from 2002 to 2010, cross-sectional REM models developed by Dechow et al. (1998) and implemented by Roychowdhury (2006) are used to estimate the proxies for REM (abnormal cash flow from operations, abnormal production costs, and abnormal discretionary expenses) and the modified Jones (1991) model is used to measure the proxy for AEM (abnormal accruals). Controlling for other determinants of REM and AEM activities, this study reveals that meeting and beating earnings benchmarks is associated with both REM and AEM activities.*

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1. Introduction

This paper further extends the research in the area of earnings management in the Australian context by examining whether firm managers engage in earnings manipulation to meet and beat earnings benchmarks. Firm managers, who engage in income-increasing earnings manipulation habitually, exercise one of two methods of earnings management: accrual-based earnings management (AEM) and real earnings management (REM). Prior research using Australian sample, has used AEM to examine the existence of earnings management in the settings of avoidance of losses (meeting benchmark), small increases in earnings (beating benchmark), and meeting or beating analyst's consensus estimates. For instance, Holland and Ramsay (2003) examine Australian firms to exhibit whether they manage earnings to avoid losses and earnings declines, and find significant discontinuities in the distribution of reported earnings, with a distinct peaked circulation with an irregularity at zero, which is consistent with benchmark beating. However, they did not examine whether this discontinuity around zero earnings is a result of earnings management or not. Subsequently, Coulton et al. (2005) study the properties of accrual earnings management under that premise and document that unexpected (abnormal/discretionary) accruals is significantly higher for benchmark beaters relative to the rest of the sample. However, they did not find any significant difference in abnormal accruals between the benchmark beaters and firms that just miss the benchmark, and suggested that the kink in the distribution of earnings is a poor proxy of earnings management.² Very recently, Habib and Hossain (2008), using three different models of accrual-based earnings management, investigate the characteristics of AEM to examine whether managers manage earnings to meet or beat analysts' estimates in Australia and failed to identify any evidence of earnings management. They suggested that future research need to consider the mechanisms of real earnings managements used by managers to meet or beat earnings benchmarks.

This study investigates the earnings management behavior of the managers of Australian firms using both real earnings management (REM) and accruals earnings management (AEM), to examine whether managers engage in earnings manipulation to meet small positive earnings and to sustain last year's performance, in the form of earnings per share (EPS). This examination is motivated by the recent benchmark meeting and/or beating using REM evidence found in the USA (Roychowdhury, 2006; Cohen et al., 2008; Gunny, 2010; and Zang, 2012), which has not been explored in Australia. Generally that might not be of great interest because of the relative similarity of the U.S. and Australian share markets; however, compared to Australia, the U.S. is a more litigious environment

² Consistent with Holland and Ramsay (2003), Coulton et al. (2005) also find a significant kink around the zero earnings. Habib and Hossain (2008) also evidence a significant kink in analyst's forecast error around zero.

with a culture of shareholder litigation. This extreme threat of lawsuits results in a bias towards the release of more bad news in the U.S., by announcing adverse earnings news early to reduce the potential risk of large stock price decline on the earnings announcement date, and to reduce the expected cost of any potential stockholder litigation, especially in the litigation intensive high-tech industries (Skinner and Sloan, 2002). On the other hand, the absence of legal class action rights, and the entitlement of successful defendants to cost recover from the accuser, has discouraged investors from litigating corporate managers in cases of poor firm performance in Australia (Taylor and Taylor, 2003).³ In addition, recent earnings management study using Australian data suggests the necessity of exploring the real activity management used by managers to report small positive earnings and sustain last period earnings (Habib and Hossain, 2008).

To measure the existence of REM and AEM, this investigation uses three proxies of REM (abnormal cash flows from operations, abnormal production costs, and abnormal discretionary expenses) and one proxy of AEM (abnormal accruals). To measure REM proxies this study follows the model developed by Dechow et al. (1998) and implemented by Roychowdhury (2006), and estimate the abnormal cash flow from operations (AB_CFO), abnormal production costs (AB_PROD) and abnormal discretionary expenses (AB_DIS). To estimate the proxy for AEM this examination uses the cross-sectional Jones (1991) model in line with recent studies (Roychowdhury, 2006; Cohen et al., 2008; Cohen and Zarowin, 2010; and Zang, 2012) and estimate abnormal accruals (AB_ACC). Moreover, these papers combine the three measures of REM into one aggregate metric of REM (AB_AGG) to capture the combined effect of REM. This study uses both univariate and multivariate analysis to examine the existence of REM and AEM across the benchmark meeting firm-years.

Using the above measures of REM and AEM, this examination evidence that the managers of Australian firms tend to engage in earnings management in the years of they are meeting and beating zero earnings thresholds. Consistent with the propositions of this research, the multivariate results document significantly higher production costs, lower discretionary expenses, and higher abnormal accruals for firms that meet small positive earnings in the form of earnings per share (classified as SusEPS firm-years) at the annual level, in comparison to the rest of the sample. Relatively similar result are also evident for the firm-years that beat the prior year's performance in the form of changes in EPS (classified as SuschaEPS firm-years), in this context, this examination finds significant evidence of REM in the form of a reduction of discretionary expenses and evidence of

³ Nevertheless, class-action litigation has been brought recently against some firms, for example AWB and Multiplex (Habib and Hossain, 2008), for breaking the Continuous Disclosure Regime (CDR) of the ASX Listing Rule 3.1, which requires immediate disclosure of all information which may affect a firm's share price in the market.

AEM in the form of significantly higher accruals compared to the rest of the observations.

The above results suggest that the managers of Australian firms that report small positive earnings are involved in real activities manipulation by overproduction to reduce cost of goods sold and by reducing discretionary expenses, and also engaged in accrual-based earnings manipulation to avoid losses and to report marginally positive earnings. Moreover, the results indicate that firm-years which report an increase in earnings compared to the prior year also engaged in REM and AEM, however, this study did not find any evidence of sales manipulation resulting in lower abnormal cash flow from operations. This examination results are robust to various measurement methods and assumptions, and validate the significance of examining earnings management in an alternative institutional context.

The remainder of the paper is structured as follows. Sections 2 outline the empirical literature relating to REM and AEM and discuss the motivation behind earnings management. Section 3 reviews the literature relating to use of REM and AEM to meet and/or earnings benchmark, leading to the hypothesis development for this paper. Section 4 describes the methodology used in this paper, including sample constructions, estimation parameters, along with related descriptive statistics. Section 5 presents the empirical results and associated discussion along with empirical models to test the hypotheses, and Section 6 summarizes the conclusions and implications of the paper.

2. Earnings management:

Conventional wisdom suggests that accounting earnings have information content (Hayn 1995), and are a key source of information used by the investors when developing expectations of future earnings. The market reacts positively to positive abnormal earnings news (Kothari, 2001) and, in conjunction with the increased use of stock-based compensation; managers are increasingly sensitive to the relation between earnings and the firm's stock prices (Dechow and Skinner, 2000). Therefore, managers acting in self-interest, as well as in shareholders' interests potentially, have strong motivation to manage earnings (DeGeorge et al., 1999).

Earnings management is the managerial action to amend the reported earnings and value of the firm in the short-run with an objective to achieve specific welfare outcomes and to mislead some firm investors, by taking advantage of opportunistic flexibilities offered by generally accepted accounting principles (GAAP) and through modification of real economic activities. A well-defined and popular definition of earnings management in the accounting literature is given by Healy and Wahlen (1999). According to them:

“Earnings management occurs when managers use judgements in financial reporting and in structuring transactions to alter financial reports to either mislead some stakeholders about the underlying economic performance of the company or to influence contractual outcomes that depend on reported accounting practices.”
(p. 368)

It is the responsibility of managers to prepare the financial statements of the firm in accordance with the provisions of Generally Accepted Accounting Principles (GAAP), and other accounting standards (FASB and IFRS standards, if applicable). The financial reporting process allows managers to exercise judgements and estimates in the preparation of general purpose financial statements, consistent with them having much better information about the operating environment of their organizations relative to external parties. This increases the worth of financial reporting as a relevant and reliable form of communication, but not if earnings management is present. This opportunity to use judgements and estimates also creates prospects for earnings management for their own benefit.⁴

Empirical studies evaluating the reasons behind earnings management document that the motives for manipulating earnings include signalling a firm's future prospects (DeAngelo et al., 1996), equity incentives (Cheng and Warfield, 2005 and Bergstresser and Philippon, 2006), compensation plans (Bauman and Shaw, 2006), stock price driven motivation (Graham et al., 2005 and Bhojraj et al., 2009), stakeholder motivation (Bowen et al., 1995), employee bonuses (Healy, 1985 and Matsunaga and Park, 2001), debt covenant violation avoidance (DeFond and Jiambalvo, 1994; Dichev and Skinner, 2002; and Dechow et al., 1996), job security (Matsumura et al., 2009) and to raise external financing (Dechow et al., 1996)⁵.

⁴ However, limits upon opportunistic earnings management do exist because of the regulatory requirement that financial statements issued to the interested parties are to be audited by an external accounting firm before being issued. DeFond and Jiambalvo (1994) propose that discrepancies among auditors and firm managers result from incentives to manipulate earnings and are more probable when the clients have Big-six auditors. Nevertheless, the auditor's ability to limit earnings manipulation differs with the quality of auditor (Becker et al., 1998). In addition, preventing earnings manipulation also depends on the effort given by the auditors (Caramanis and Lennox, 2008). Furthermore, Nelson et al. (2002) reveal that, if the earnings management efforts are organized with respect to specific accounting standards, auditors are less likely to adjust that compared to the earnings management efforts structured with nonexistence of definite accounting standards unless material in nature.

⁵ Graham et al. (2005) survey evidence indicates some more possible incentives according to the opinions of CFO's, from engaged in REM to beat or meet earnings benchmark, which includes helps to generate trustworthiness into the capital market, sustain or increase stock prices, increase the external standing of management, deliver future growth prospects to investors, moderate stock price instability, and assure stockholders that the business is steady.

Extant evidence classified earnings management into two groups: accrual earnings management (AEM) and Real earnings management (REM). The former has no cash flow consequences; however, the later has cash flow consequences. AEM is characteristically accomplished by shifting income from future periods to the present period. Examples of AEM includes recording revenues before they are realizable, understatements of bad debt expenses, drawing down the provision for reserves for bad debts, selective inventories and marketable securities valuation, changing methods of depreciation, and the classification of items as above or below the line of profit from operations.

REM, which is a recent phenomenon, is accomplished through modification of real operating activities of the firm. Examples include introducing price discounts or more lenient credit terms to increase sales temporarily, over-production to reduce the per unit cost of products, deferring or eliminating selling, administrative, and general (SG&A) expenses, reducing research and development (R&D) expenditure, and the disposal of investments and long-term assets.

Graham et al. (2005) suggest that, after implementation of the Sarbanes-Oxley Act 2002 (SOX), financial statements are subject to more scrutiny, therefore, firm managers would prefer to engage in REM because they are less likely to be detected by the auditors and less likely to be litigated against relative to undertaking AEM. However, the consequences of REM appear to be more financially significant to the firm. Subsequent studies support the empirical validity of the Graham et al. (2005) findings. They find that managers engaged in REM to meet and/or beat zero earnings, last year's earnings, and analysts forecast (Roychowdhury, 2006, Gunny, 2010, and Zang 2012). Cohen et al. (2008) present evidence that managers have moved to REM from AEM after the implementation of SOX.

3. Literature review and hypothesis development

The importance attached to earnings figures, and the assumption that investors rely on simple earnings benchmarks suggest that reporting positive earnings; avoiding losses; earnings superior than last year; and earnings that beat or meet analysts forecast will have positive valuation implications (Burgstahler and Dichev 1997; DeGeorge et al. 1999; Brown and Caylor 2005; Brown 2001). In addition, prospect theory suggest that investors would prefer to invest in firms that report a sequence of small gains rather than

companies with unstable earnings (Koonce & Mercer 2005).⁶ Burgstahler and Dichev (1997) suggest that benchmark beating evidence is also consistent with the expectation of prospect theory. They claim that firms are responsive to the idea that the market may have preferences for specific earnings patterns (zero earnings and a vicinity of zero changes in earnings).

Since financial statements usually do not directly provide information regarding firm's future prospects, investors may use an observed earnings threshold to evaluate a firm's future performance. Investors compensate a firm with higher valuation if the firm outstrips an earnings benchmark and lowers the valuation if it misses the benchmark. Therefore, if firm managers deliberately manage earnings in the form of REM and/AEM to report a marginally positive earnings it is likely that they have incentives for benchmark beating.

3.1. Meeting and/or beating earnings benchmark: empirical evidence from distributional test

Initial evidence of beating or meeting a certain earnings benchmark was shown by Hayn (1995). He presented that there is a discontinuity of earnings around the zero earnings benchmark using earnings per share (EPS) deflated by share price. Using annual level earnings observation, Burgstahler and Dichev (1997) document that firm managers engage into cash flow management and take the advantage of opportunistic accrual earnings management to report increases in earnings. They find that avoiding losses is more predominant than avoiding earnings decreases and reveal that there is a strong discontinuity in the distribution of firm-years around zero earnings.⁷ Using a quarterly earnings sample, DeGeorge et al. (1999) investigate the comparative significance of three earnings management benchmarks that management try to achieve, and reveal that management rank their earnings benchmarks as: (a) report positive earnings (for example,

⁶ Koonce and Mercer (2005), assuming that psychology theories can enhance the insights offered by accounting researchers and surveying the 704 empirical papers published in top 5 accounting journals shows that value function is steeper in the loss domain than in the gain domain, implying that pain associated with loss is greater than the pleasure associated with an equal sized gain. The steepness of the value function in the loss domain implies that investors will experience relatively greater disutility from small reported losses. The concavity of the value function in the gain domain implies that investors will experience diminishing marginal utility from additional reported gains. These features suggest that investors will prefer to invest in companies that report a series of small gains rather than in companies that include some large gains and some small losses.

⁷ Burgstahler and Dichev (1997) reveal that 30% to 44% of the firms with marginally negative pre-managed earnings use discretion to cross the zero earnings threshold, and 8% to 12% of the firms with small pre-managed earnings decreases use discretion to report earnings escalations.

1 penny a share); (b) avoid earnings decreases; and (c) avoid negative earnings surprise.⁸ However, Durtschi and Easton (2005) present that the frequency distribution of reported earnings per share (EPS) does not exhibit a discontinuity at zero, in contrast to frequency distributions of income scaled by lagged market value of equity, total assets, sales and employee numbers. Subsequently, Dechow et al. (2003), using annual earnings level observations, examine the three benchmark as identified by DeGeorge et al. (1999) and exhibit that avoiding negative earnings surprise is the most important benchmark management try to achieve. Holland and Ramsay (2003) examine Australian firms to reveal whether they manage earnings to avoid losses and to avoid earnings decreases. Using annual level net profit after taxes scaled by lagged total assets as the proxy for earnings, they plot the frequency distribution with an interval width of 0.01 and find similar results to those presented by Burgstahler and Dichev (1997).

3.2. Meeting and beating earnings benchmark and accrual-based earnings management (AEM): empirical evidence

Earnings manipulation using flexible or abnormal components of accruals is less likely to be noticeable and is more problematic to infer (Payne and Robb, 2000). In relation to intentional changes in accounting methods, accrual manipulation is a less costly means of shifting earnings between periods (Healy, 1985). Prior research has documented a number of strategies of accrual-based earnings management (AEM) to meet and/or beat earnings threshold, for example, discretionary accruals management (Payne and Robb, 2000; Dechow et al., 2003; Hensen, 2008; Barua et al., 2006), specific component of accruals (Marquardt and Wideman, 2004), classification shifting (McVay, 2006 and Doyle et al, 2011) deferred tax expense (Phillips et al, 2003 and Ayers et al., 2006), EPS rounding and working capital accruals (Das and Zhang, 2003). Assuming that managers are motivated to exercise discretion over the accrual component of earnings to remove negative earnings shocks, Payne and Robb (2000) show that, when pre-managed earnings are lower than the market anticipation, managers use income-increasing discretionary accruals to increase reported earnings. Similar evidence has been documented by Barua et al. (2006), where they show that firms' with pre-managed profits are more likely to use discretion over abnormal accruals to meet or beat the prior period earnings compared to the firms' that have pre-managed losses.

In an empirical study, Dechow et al. (2003) examine the discretionary accruals for firms with small profits and losses, and present that marginal, or small, profit firms have significantly high discretionary accruals as expected; however, interestingly, firms with

⁸ DeGeorge et al. (1999) indicate that the first benchmark arises from the psychologically important differences between positive and negative numbers and the remaining benchmarks arise from performance relative to the prior period.

marginal losses also have significantly high discretionary accruals and there is no significant difference in the unexpected accruals between small profit and small loss firms. Similar results were also presented by Coulton et al. (2005) and Habib and Hossain (2008) using Australian data. However, Hensen (2008) proposed that firms that marginally exceed earnings threshold, and that marginally fail to meet earnings threshold, might have different levels of discretionary accruals because firms' that fail to meet the earnings benchmark might have used discretionary accruals to avoid an alternative benchmark. After removing firms with the incentive to meet an alternative benchmark from the sample, he finds that small profit firms have higher unexpected accruals relative to those that missed the earnings benchmark.

3.3. Meeting and beating earnings benchmark and real earnings management (REM): empirical evidence

Accounting earnings have two components, a cash flow component and an accrual component. Most of the earnings management studies to date use the discretionary or abnormal component of accruals as a proxy of earnings management (McNichols, 2000). Since accounting earnings includes a cash flow component, in addition to accrual management, firms' can also manipulate real operating activities to report positive profits. After the implementation of the SOX, there is increasing literature that managers are enthusiastic to give up economic value to meet short-run earnings targets. For example, Graham, Harvey, and Rajgopal (2005) survey 401 CFOs and report that managers are willing to take actions that are not economically beneficial to the firm if those actions assist the managers to meet a particular earnings benchmark. 51% of the CFOs rank bottom line earnings, earnings per share (EPS) as the number one financial metric to the external constituents, which is much higher than revenues (12%) and cash flow from operations (12%). When asked what measures they might take in order to meet an earnings target, surprisingly, 80% of the participants replied that they would prefer to reduce discretionary expenditures; more than 55% are willing to sacrifice or delay value-increasing positive NPV projects; 41% would favor to book revenues now rather than next quarter; 39% state that they are willing to provide incentives to customers to buy more products this quarter; and 28% are willing to draw down reserves. Executives also suggest that they are more reluctant to use opportunistic GAAP based accrual earnings management (AEM). Subsequent research on myopic behavior and real earnings management (REM) as a proxy of earnings management, support the empirical validity of the Graham et al. (2005) results (Roychowdhury, 2006; Cohen et al., 2008; Cohen and Zarowin, 2010; Gunny, 2010; and Zang, 2012).

Relatively similar findings also documented by Woodhouse and Mather (2013) in the Australian context. Woodhouse and Mather (2013) survey 116 Australian CFOs and

report that reporting profit ($EPS > 0$) and exceeding prior year profit ($EPS_t > EPS_{t-1}$) are the most important targets of Australian firm managers. Authors show that, managers believe that, meeting an earnings benchmark assists in building credibility with the capital market, increasing stock prices, increasing external reputation of the management team, and conveying future growth prospects to investors, indicating that Australian managers might have strong incentives to manage earnings.⁹

An empirical study by Roychowdhury (2006) presents that executives employ price discounts to momentarily increase sales to manage the cash flow component of earnings, produce more to decrease the per unit cost of goods sold, and reduce their discretionary expenses to increase earnings to meet marginally positive earnings benchmarks in the form of return on assets (ROA). Cohen et al. (2008) examine managers' earnings management behaviour before and after the passage of SOX (Sarbanes – Oxley Act of 2002) using the REM proxies developed by Roychowdhury (2006). They presents that REM replaced the use of AEM after the SOX introduction due to the greater scrutiny placed on the examination of accounting practices.

Gunny (2010) documents that real activity manipulation is positively associated with the firms meeting small positive earnings and sustaining last period earnings. In addition to the zero earnings benchmark, Zang (2012) study firms-years that meeting zero earnings (in the form of ROA), beating last year's earnings (in the form of changes in EPS), analysts' forecasts and managements forecast and show that, in aggregate, both accrual and real activities manipulation is positively associated with these activities. She also documents that firm's trade-off tools of earnings management depending on their relative costs of doing so.

3.4. Hypothesis development

Section 3.1 provides evidence that there is a strong discontinuity around zero earnings benchmark; the question then is why investors rely on simple heuristic cut-offs. One possible explanation for these results is that investors wish to invest in firms that report a series of small gains rather than firms with unstable earnings, as suggested by Koonce & Mercer (2005), and, therefore, the marginal benefits of earnings management increase

⁹ Woodhouse and Mather (2013) show that 74% of the CFOs are willing to accept value increasing positive NPV projects if it does not affect the earnings benchmark, however, when the probability of missing earnings benchmark increases the probability of accepting the project decreases. For example, the authors reveal that 59%, 52%, and 38% of the respondents would prefer to sacrifice value-increasing positive NPV projects if accepting it results in missing the earnings benchmark by 50 cents, 20 cents and 10 cents respectively, suggesting that Australian managers are willing to engage in REM practices to meet/beat earnings benchmark.

sharply as firms meet or beat an earnings benchmark. If interested parties really employ such a heuristic cut-off, then the means by which firms accomplish the benchmark is immaterial and only reported earnings matters, and the persistence of earnings is of little importance (Marquardt and Wiedman, 2004). Therefore, incurring high cost accrual earnings management is less justifiable to managers and they can easily achieve their objective using low cost real earnings management, leading to the following propositions (in alternate form):¹⁰

H1: Firm-years that report small positive earnings in the form of earnings per share (EPS) exhibit evidence of REM and/or AEM

H2: Firm-years that sustain last year's performance in the form of the change in earnings per share (EPS) exhibit evidence of REM and/or AEM

4. Research methodology and descriptive statistics

4.1. Sample selection

To evaluate the above hypotheses, initial sample contains all Australian companies with sufficient information to calculate the proxies for earnings management, listed on the Australian Securities Exchange (ASX) over the analysis period from 2002 to 2010. The firms are not selected randomly; any firms with sufficient financial information to estimate at least one proxy for REM and/or AEM during the observation period are included in the sample. The two digit Global Industry Classification Code (GICS) is used to classify the firms into industry groups. Firm-years with insufficient data to measure at least one proxy for REM and/or AEM are removed from the sample. Firms belonging to financial services (GICS code 40) and utility services (GICS code 55) industry groups are excluded from the sample, because prior studies suggest that these firms are subject to regulatory requirements and inclusion of these firms may unnecessarily complicate research design related to earnings management. Since this examination bases earnings management measures on cross-sectional regressions using industry-year information, industry-year portfolios with less than eight observations were dropped from the sample. A total of 588 firms, and a total of 4,287 firm-years observations, meet the above criteria.

¹⁰ The introduction of Sarbanes-Oxley Act (SOX) has made accrual earnings management (AEM) more costly because it is more likely to draw auditor attention and regulatory scrutiny; in addition, relying on AEM alone is more risky (Cohen and Zarowin, 2010). On the other hand, REM involves modification of real operating activities and is less likely to draw auditors and regulatory agencies scrutiny (Graham et al., 2005). In relation to SOX, a similar Act was implemented in Australia on July 1, 2004, which is Corporate Law Economic Reform Program (Audit Reform and Corporate Disclosure) Act 2004 (CLERP 9).

The financial information is collected from the Bureau van Dijk Electronic Publishing Osiris database. The company share price information is collected from the Thomson Reuters DataStream database and capital expenditure information is collected from the Thomson Reuters World scope database. Cash flow from operations data is not available for Australian firms in the Osiris database until 2004, with an exception of a few cases, restricting the study sample period to between 2002 and 2010. The sample data collection begins from 2002 to allow for the estimation of the normal level of production cost, which requires sales data for the preceding two years.

4.2 Selection of suspect firm-years

To classify firms that meet zero earnings benchmark in the form of earnings per share (EPS), this paper clusters firm-years into intervals based EPS, then this examination constructs groups of earnings per share (EPS) with an interval width of \$0.00 and \$0.02 and hypothesises that firm-years in the interval to the immediate right of zero have strong incentives to meet the zero earnings benchmark. The Suspect EPS (SusEPS) firm-years have an EPS that is in between \$0.00 and \$0.02; this research excludes EPS of \$0.00 to avoid the rounding effect.¹¹ Similarly, firm-years with changes in EPS that are greater than or equal to \$0.00 and less than \$0.02 are classified as suspect changes in EPS (SuschaEPS) firm-years.¹²

4.3 Descriptive statistics

4.3.1 A Comparison between SusEPS firm-years and the Rest of the Sample

Table 1 reports the descriptive statistics for variables categorised based on Suspect EPS firm-years (SusEPS group) relative to the rest of the sample. The *Rest of the sample* category includes firm-years with earnings per share (EPS) that are not in between \$0.00 and \$0.02. This table presents the mean and median figures, along with differences in means and medians, for the important financial variables.

¹¹ This paper uses the statistical method to estimate the interval width developed by Freedman-Diaconis (1981), and used by Dichev and Skinner (2002), which is $2(IQR)n^{-1/3}$, where IQR represents the EPS sample interquartile range and n represents the number of observation. This model results in an interval width of \$0.02.

¹² Burgstahler and Dichev (1997) argue that "*Anecdotal evidence and evidence from previous papers suggest that incentives to avoid earnings decreases become stronger with the length of the previous run of earnings increases. These stronger incentives should lead to a more pronounced effect of earnings management in the intervals close to zero.*"(p.105). Subsequent research in the context of REM supports the empirical validity of Burgstahler and Dichev (1997) argument, documenting that managers of the firm-years into the interval width immediate right to zero actively engaged in earnings manipulation to avoid losses and to meet zero earnings benchmarks (Roychowdhury, 2006; Gunny, 2010; and Zang, 2012).

Table 1: Descriptive Statistics – Comparison between Suspect EPS Firm-Years and the Rest of the Sample

	SusEPS firm-years		Rest of the sample		Difference	
	Mean	Median	Mean	Median	Mean	Median
					(t – statistics)	(z – statistics)
TA_t	95.073	22.751	470.841	50.778	-375.768***	-28.027***
					(-5.34)	(-7.59)
MVE_t	95.435	13.852	487.325	46.568	-391.890***	-32.716***
					(-5.19)	(-10.95)
MTB_t	1.745	1.091	2.661	1.657	-0.916***	-0.566***
					(-3.85)	(-6.13)
ROA_t	0.053	0.033	-0.110	0.032	0.163***	0.001***
					(6.14)	(3.41)
EPS_t	0.005	0.005	0.102	0.021	-0.097***	-0.016**
					(-6.85)	(-2.43)
SA_t/TA_{t-1}	1.328	1.057	1.216	0.923	0.112	0.134**
					(1.34)	(2.57)
CFO_t/TA_{t-1}	0.052	0.040	-0.024	0.055	0.076***	-0.015
					(2.64)	(-0.03)
$PROD_t/TA_{t-1}$	0.714	0.469	0.652	0.387	0.062	0.082**
					(1.15)	(2.39)
DIS_t/TA_{t-1}	0.438	0.311	0.462	0.302	-0.024	0.009
					(-0.62)	(0.12)
ACC_t/TA_{t-1}	0.009	-0.008	-0.096	-0.051	0.105***	0.043***
					(4.00)	(7.15)

***Significant at 1% level. **Significant at 5% level. *Significant at 10% level, two-tailed.

The numbers in parenthesis are t-statistics from the two groups mean comparison test for the differences in means, and z-statistics from the Wilcoxon rank-sum test for the differences in medians. The sample consists of firm-year observations from 2002 to 2010 for SA_t , TA_t , MVE_t , MTB_t , and EPS_t , and from 2003 to 2010 for ROA_t , SA_t/TA_{t-1} , CFO_t/TA_{t-1} , $PROD_t/TA_{t-1}$, DIS_t/TA_{t-1} , and ACC_t/TA_{t-1} .

The results in Table 1 indicate that average annual total assets (TA_t) for the suspect EPS firm-year observations are \$95.073 million, with a median of \$22.751 million, and these are significantly lower than for the rest of the sample, with the group differences being significant at the 1% level. The year-end average market value of equity (MVE_t) and market to book value ratio (MTB_t) for the SusEPS sample is \$95.435 million and 1.745 respectively, with medians of \$13.852 million and 1.091 respectively. The mean and median MVE_t and MTB_t levels for the SusEPS sample are much lower than compared to the rest of the sample, and the mean and median group differences are statistically significant from zero.

The mean (median) ROA_t for the suspect group is 0.053 (0.033) and for the non-suspect group this is -0.111 (0.032). These figures signify that the mean and median ROA_t for the suspect group are significantly higher than that for the rest of the sample. The year-end average EPS for the SusEPS firm-years is \$0.005 with a median of \$0.005, between \$0.00 and \$0.02 as expected; and the mean and median EPS for the SusEPS observations are lower than for the rest of the observations and the differences are statistically significant at the 1% level.

The mean (median) sales to total assets ratio (SA_t/TA_{t-1}), cash flow from operations to total assets ratio (CFO_t/TA_{t-1}), and production costs to total assets ratio ($PROD_t/TA_{t-1}$) for the SusEPS group are 1.328 (1.057), 0.052 (0.040), and 0.714 (0.469), and are higher than for the rest of the sample group, with group differences in the mean and median levels that are significant at least at the 5% level, except the median CFO_t/TA_{t-1} , the mean SA_t/TA_{t-1} and the mean $PROD_t/TA_{t-1}$ ratios. However, there is no significant difference in the mean and median discretionary expenses to lagged total assets ratio (DIS_t/TA_{t-1}) between the two groups. A significantly higher mean CFO_t/TA_{t-1} ratio reveals that suspect-EPS firms are engaged in income-decreasing sales manipulation; however, the significantly higher $PROD_t/TA_{t-1}$ ratio reflects that this group of firms is also potentially involved in income-increasing REM activities.

Variable description: Please see Appendix 1 for variable descriptions.

On the other hand, the mean (median) total accruals to lagged total assets ratio (ACC_t/TA_{t-1}) for the Suspect EPS firm-year group is 0.009 (-0.008) and for the other observations this is -0.096 (-0.051). The mean and median ACC_t/TA_{t-1} ratios of the suspect EPS firm-years are much higher than that for the rest of the sample, and the mean and median group differences are significant at the 1% level. This result indicates that suspect firms that are meeting zero earnings thresholds in the form of EPS are likely taking advantage of GAAP-based opportunistic earnings management.

A Comparison between SuschaEPS firm-years and the Rest of the Sample

Table 2 reports the descriptive statistics for variables categorised based on Suspect changes in EPS firm-years (SuschaEPS group) relative to the rest of the sample. The *Rest of the sample* category includes firm-years with changes in earnings per share (EPS) that are not in between \$0.00 and \$0.02. This table presents the mean and median figures, along with differences in means and medians and related statistical tests, for the important financial variables.

Table 2: Descriptive Statistics – Comparison Between Suspect Change in EPS Firm-Years and the Rest of the Sample

	SuschaEPS firm-years		Rest of the sample		Difference	
	Mean	Median	Mean	Median	Mean	Median
					(t – statistics)	(z – statistics)
TA_t	216.238	16.797	510.430	58.819	-294.192***	-42.022***
					(-5.26)	(-13.24)
MVE_t	229.910	17.389	522.436	52.956	-292.526***	-35.567***
					(-4.88)	(-10.57)
MTB_t	2.768	1.678	2.585	1.589	0.183	0.089
					(0.98)	(1.36)
ROA_t	-0.218	-0.018	-0.075	0.035	-0.143***	-0.053***
					(-7.28)	(-6.24)
EPS_t	0.036	0.000	0.114	0.025	-0.078***	-0.025***
					(-6.91)	(-5.68)
SA_t/TA_{t-1}	1.071	0.797	1.233	0.944	-0.162***	-0.147***
					(-2.64)	(-3.70)
CFO_t/TA_{t-1}	-0.129	0.015	0.004	0.060	-0.133***	-0.045***
					(-6.38)	(-6.99)
$PROD_t/TA_{t-1}$	0.551	0.333	0.661	0.401	-0.110***	-0.068***
					(-2.72)	(-3.13)
DIS_t/TA_{t-1}	0.533	0.338	0.440	0.290	0.093***	0.048***
					(3.19)	(3.69)
ACC_t/TA_{t-1}	-0.105	-0.050	-0.088	-0.048	-0.017	-0.002
					(-0.89)	(-0.52)

***Significant at 1% level. **Significant at 5% level. *Significant at 10% level, two-tailed.

The numbers in parenthesis are t-statistics from the two groups mean comparison test for the differences in means, and z-statistics from the Wilcoxon rank-sum test for the differences in medians. The sample consists of firm-year observations from 2002 to 2010 for SA_t , TA_t , MVE_t , MTB_t and EPS_t , and from 2003 to 2010 for ROA_t , SA_t/TA_{t-1} , CFO_t/TA_{t-1} , $PROD_t/TA_{t-1}$, DIS_t/TA_{t-1} , and ACC_t/TA_{t-1} .

Variable description: Please see Appendix 1 for variable descriptions.

The results in Table 2 present that the year-end average total assets (TA_t) and market value of equity (MVE_t) for the SuschaEPS group are \$216.238 million and \$229.910 million respectively, with medians of \$16.797 million and \$17.389 million respectively. The mean and median TA_t and MVE_t levels for the SuschaEPS sample are much lower than compared to the rest of the sample, and the mean and median group differences are statistically significantly different from zero. However, there is no significant difference between the mean and median MTB_t ratios between the two groups. The mean and median ROA_t and EPS_t of the SuschaEPS group are much lower than that for the rest of the observation, with the group difference being statistically significant at the 1% level.

The mean (median) sales to total asset ratio (SA_t/TA_{t-1}), cash flow from operations to total assets ratio (CFO_t/TA_{t-1}), and production costs to total assets ratio ($PROD_t/TA_{t-1}$) for the suspect firm-years cluster are 1.017 (0.797), -0.129 (0.015), and 0.551 (0.333) respectively, and these are significantly lower than the equivalent ratios for the non-suspect firm-years cluster. On the other hand, discretionary expenses as a proportion of lagged total assets (DIS_t/TA_{t-1}) for the SuschaEPS category are much higher than that for the rest of the observations, with the mean and median group differences being significant at the 1% level. There is no significant difference, however, between the two groups based on the accruals to lagged total assets ratio (ACC_t/TA_{t-1}) variable.

Similar to the firms reporting small increase in earnings in the form of changes in EPS, the CFO_t/TA_{t-1} , $PROD_t/TA_{t-1}$, and DIS_t/TA_{t-1} ratios of firms' reporting small increase in earnings in the form of changes in EPS also show conflicting results. The mean (median) CFO_t/TA_{t-1} ratios of SuschaEPS firm-year observations indicate that these firms appear to be significantly engaged in sales manipulation. However, the significantly lower (higher) $PROD_t/TA_{t-1}$ (DIS_t/TA_{t-1}) ratio suggesting that this set of firm-year observations are possibly partaking in income-decreasing REM activities. Moreover, no evidence of AEM practice is evident.

4.4 Estimation parameters

To evaluate the hypotheses, the primary measurement tool is the proxies of REM and AEM. The proxies for REM are abnormal cash flow from operations (AB_CFO),

abnormal production costs (AB_PROD), and abnormal discretionary expenses (AB_DIS). The proxy for AEM is abnormal or discretionary accruals (AB_ACC). The following estimation parameters are used to estimate the expected (normal) levels of operational activities related to REM and AEM. To estimate the proxies of REM, this research relies on the model developed by Dechow et al. (1998), and as applied by Roychowdhury (2006). Subsequent studies provide the empirical validity of the models (Cohen et al. 2008; Cohen and Zarowin 2010; Gunny 2010; Badertscher 2011; Zang 2012).

The following cross-sectional ordinary least square (OLS) models are estimated for every year and industry, with at least 8 observations, to estimate the normal level of cash flow from operations, production costs and discretionary expenses. The industries are classified according to the two-digit Global Industry Classification Standard (GICS) code.

Normal level of cash flows from operations

$$CFO_t / TA_{t-1} = \gamma_0 + \gamma_1 1 / TA_{t-1} + \gamma_2 SA_t / TA_{t-1} + \gamma_3 \Delta SA_t / TA_{t-1} + \varepsilon_t \quad (1)$$

Normal level of production costs

$$PROD_t / TA_{t-1} = \gamma_0 + \gamma_1 1 / TA_{t-1} + \gamma_2 SA_t / TA_{t-1} + \gamma_3 \Delta SA_t / TA_{t-1} + \gamma_4 \Delta SA_{t-1} / TA_{t-1} + \varepsilon_t \quad (2)$$

Normal level of discretionary expenses¹³

$$DIS_t / TA_{t-1} = \gamma_0 + \gamma_1 1 / TA_{t-1} + \gamma_2 SA_{t-1} / TA_{t-1} + \varepsilon_t \quad (3)$$

The abnormal level of cash flow from operations (AB_CFO), abnormal production costs (AB_PROD), and abnormal discretionary expenses (AB_DIS) are then estimated as a deviation of the normal (predicted) cash flow from operations from the actual cash flow from operations, normal production costs from the actual production costs, and normal discretionary expenses from the actual discretionary expenses respectively.

Aggregate real activities manipulation

To examine the combined effect of REM, this study aggregates the above three REM measures into one proxy, because firms might engage in more than one type of REM,

¹³ Assessing discretionary expenses as a function of current period sales may create a misspecification problem. This is because if the firm managers do not reduce discretionary expenses but manipulate sales upwards to reach an earnings benchmark, this may result in a very small discretionary expense residual from running a regression (Roychowdhury, 2006 and Cohen and Zarowin, 2010). To remove the above problem, following Cohen and Zarowin (2010), we model discretionary expenses as a linear function of last period sales.

denoted by abnormal aggregate REM (AB_GG). Abnormal aggregate REM (AB_GG) is, thus, equal to the sum of abnormal cash flow from operations, abnormal production costs, and abnormal discretionary expenses. To calculate the aggregate proxy, the abnormal level of production cost is multiplied by (-1), similar to Gunny (2010). Therefore, a lower aggregate value indicates a greater amount of real activities manipulation to upwardly bias earnings.

$$AB_AGG_t = AB_CFO_t + AB_PROD_t * (-1) + AB_DIS_t \quad (4)$$

The normal level of accruals

Prior studies indicate that most of the AEM research to date uses abnormal (discretionary) total accruals as a measure for AEM.¹⁴ To link this examination to prior research, this examination, therefore, also estimates the normal level of total accruals following the cross sectional Jones (1991) model, as applied in many prior studies (DeFond and Jiambalvo, 1994; Cohen et al., 2008; Cohen and Zarowin, 2010; and Zang, 2012). Consistent with Hribar and Collins (2002), this examination defines total accruals as the difference between earnings before extraordinary items and cash flows from operations. The normal level of discretionary accruals is estimated using the following model:

The following cross-sectional ordinary least square (OLS) model is estimated for every year and industry, with at least 8 observations, to estimate the normal level of accruals. The industries are classified according to the two-digit Global Industry Classification Standard (GICS) code.

$$TACC_t / TA_{t-1} = \gamma_0 + \gamma_1 \Delta TA_{t-1} / TA_{t-1} + \gamma_2 \Delta SA_t / TA_{t-1} + \gamma_3 PPE_t / TA_{t-1} + \varepsilon_t \quad (5)$$

The abnormal level of accruals (AB_ACC) is then estimated as the deviation of the normal (predicted) level of accruals from the actual accruals. The abnormal level of accruals is recognized as a proxy for firm managers' accrual-based earnings management.

Firms suspected of REM are expected to have negative abnormal cash flow from operations (AB_CFO); positive abnormal production costs (AB_PROD); negative abnormal discretionary expenses (AB_DIS); negative abnormal aggregate REM (AB_GG); and positive abnormal accruals (AB_ACC).

Variable description: Please see Appendix 1 for variable description.

Table 3 presents the descriptive statistics related to the abnormal REM and AEM variables from Equations 1 through 5. To limit the influence of noisy estimation errors,

¹⁴ See Healy and Wahlen (1999) and McNichols (2000).

all continuous variables are winsorized at the top and bottom 1% level. The mean (median) abnormal cash flow from operations (*AB_CFO*) is 0.001 (0.006) with a standard deviation of 0.222. The mean (median) abnormal production costs (*AB_PROD*) is 0.002 (0.016) with a standard deviation of 0.337. The mean (median) abnormal discretionary expenses (*AB_DIS*) is -0.005 (-0.043) with a standard deviation of 0.325. The mean and median abnormal aggregate REM (*AB_AGG*) levels are -0.014 and -0.050 with a standard deviation of 0.616. The mean (median) abnormal accruals (*AB_ACC*) is 0.001 (0.013) with a standard deviation of 0.223. The 1st and 3rd quartiles are also reported to interpret the variable distributions and identify outliers. The percentage of positive observations ranged from 35.71% for (*AB_DIS*) to 54.61% for (*AB_ACC*), and on average is 48.11% (un-tabulated), suggesting that the methods used for estimating the normal or expected levels of the REM and AEM proxies are reasonable.

Table 3 also reports the skewness and kurtosis data related to the distribution of the abnormal variables. The skewness statistics for *AB_CFO*, *AB_PROD*, and *AB_ACC* are -0.236, -0.366, and -0.086 respectively. These skewness statistics are relatively small and close to zero, and are lower than the prior studies, indicating that the distributions are symmetrically distributed. The kurtosis data related to the distributions of the abnormal REM and AEM variables are also consistent with prior studies, indicating that the tails of the distribution are a little bit heavier than for a normal distribution.¹⁵

Table 3: Descriptive Statistics for Real Earnings Management (REM) and Accrual Earnings Management (AEM): Residuals from Equations 1 to 5

	Mean	Median	Std. Dev.	Q1	Q3	Skewness	Kurtosis	% Positive
<i>AB_CFO</i>	0.001	0.006	0.222	-0.089	0.097	-0.236	5.927	51.85
<i>AB_PROD</i>	0.002	0.016	0.337	-0.134	0.156	-0.366	5.487	53.73
<i>AB_DIS</i>	-0.005	-0.043	0.325	-0.157	0.099	1.161	7.244	35.71
<i>AB_AGG</i>	-0.014	-0.050	0.616	-0.315	0.241	0.562	6.048	44.65
<i>AB_ACC</i>	0.001	0.013	0.223	-0.074	0.090	-0.086	6.918	54.61

Variable description: Please see Appendix 1 for variable descriptions.

¹⁵See Gunny (2010), p. 870

5. Empirical analysis and results

5.1 Univariate analysis of the existence of REM and AEM

The initial testing for the existence of REM and AEM in the year of suspect EPS (SusEPS) employs group comparison analysis, based on examining the mean and median proxies for REM and AEM across the SusEPS firm-years and for the rest of the sample. A similar group comparison analysis is also accompanied between the suspect changes in EPS (SuschaEPS) firm-years and rest of the sample. The result from these analyses are provided in the Tables 3 and 4. The proxies of REM are abnormal cash flow from operations (AB_CFO); abnormal production costs (AB_PROD); abnormal discretionary expenses (AB_DIS); and aggregate real earnings management (AB_AGG). The proxy for AEM is the abnormal accruals (AB_ACC).

The abnormal or discretionary component of the REM and AEM proxies are used as these are fundamentally controlled by the managers of the suspect firms. This investigation did not include the normal or non-discretionary component of the REM and AEM proxies because the normal REM and AEM are primarily exaggerated by the normal operational conditions of the firm.

5.1.1 Firm-years Reporting Small Positive Earnings in the form of Earnings per Share (EPS)

Table 4 reports the univariate results of REM and AEM across the suspect EPS firm-years group (meet) and for the rest of the sample observations. SusEPS firm-years represents firm-year observations reported earnings per share (EPS) that is in between \$0.00 and \$0.02, the rest of the sample represents firm-year observations reported EPS that is not in between \$0.00 and \$0.02.

The mean (median) abnormal cash flow from operations (*AB_CFO*) across the SusEPS firm-year group is 0.046 (0.031) and both are much higher than for the rest of the sample, with differences being significant at the 1% level, suggesting that the managers of the suspect EPS firm-years are not involved in sales manipulation which will result in a lower cash flow from operations. This is somewhat surprising result, however, this specification indicates that the managers of SusEPS firm-years significantly manage earnings downwards. In addition, the mean and median abnormal production costs (*AB_PROD*) of the suspect firm-years are 0.027 and 0.028, and are higher than for the rest of the sample; however, the group variance is not significantly different from zero and does not provide support for Hypothesis 1.

Consistent with Hypothesis 1, Table 4 presents evidence that the managers of SusEPS firm-years use discretionary expenses as a means to manage earnings in this setting. The mean (median) abnormal discretionary expenses is significantly negative, with a mean (median) of -0.076 (-0.086) for the SusEPS group versus a mean (median) of 0.002 (-0.037) for the rest of the sample, with the group differences being significant at the 1% level.

Table 4: Mean Median REM and AEM Proxies: A Comparison between Suspect-EPs (SusEPS) Firm-Years and the Rest of the Sample

	SusEPS firm-years		Rest of the sample		Difference	
	Mean	Median	Mean	Median	Means (t-statistics)	Medians (z-statistics)
<i>AB_CFO</i>	0.046	0.031	-0.004	0.004	0.052***	0.027***
					(3.55)	(3.07)
<i>AB_PROD</i>	0.027	0.028	-0.001	0.013	0.028	0.015
					(1.25)	(1.14)
<i>AB_DIS</i>	-0.076	-0.086	0.002	-0.037	-0.078***	-0.049***
					(-3.86)	(-4.93)
<i>AB_AGG</i>	-0.066	-0.067	-0.007	-0.046	-0.059	-0.021
					(-1.39)	(-1.41)
<i>AB_ACC</i>	0.074	0.053	-0.005	0.010	0.079***	0.043***
					(5.47)	(5.80)

***Significant at 1% level. **Significant at 5% level. *Significant at 10% level, two-tailed. The numbers in parenthesis are t-statistics from the two-group mean comparison test, and z-statistics from the Wilcoxon rank-sum test.

Variable description: Please see Appendix 1 for variable descriptions.

The abnormal aggregate REM (*AB_AGG*) of the suspect EPS firm-years is lower than for the rest of the sample, with mean (median) levels of -0.066 (-0.067), however, the mean and median abnormal aggregate levels are not significantly different from those of the rest of the sample, indicating that the managers of the SusEPS firm-years are not engaged in greater levels of overall real earnings management activities.

Consistent with Hypothesis 1, Table 4 exhibits evidence of significantly higher discretionary or abnormal accruals (*AB_ACC*) for the suspect EPS firm-years relative to the rest of the sample. The mean (median) *AB_ACC* are 0.074 (0.053) for the suspect group and -0.005 (0.010) for the non-suspect group, with the differences being statistically significant at the 1% level. This result suggests that the managers of the

SusEPS firm-years are actively engaged in accrual manipulation to reach the zero-earnings benchmark in this context.

5.1.2 Firm-Years Reporting Small Increases in Earnings Relative to the Prior-Year in the form of Earnings per Share (EPS)

Table 5 shows the univariate results of REM and AEM for firm-years that just beat the prior period earnings. SuschaEPS firm-years represent firm-year observations having changes in EPS that are greater than or equal to \$0.00 but less than \$0.02 and the rest of the sample represent firm-year observations having changes in EPS that are less than \$0.00 or greater than or equal to \$0.02. Table 5 reports that abnormal discretionary expenses are significantly lower for the firm-years that beat last year's performance in the form of change in EPS, and this supports Hypothesis 2.

However, the mean and median abnormal cash flow from operations for the SuschaEPS group are much higher than that for the rest of the sample, with the group differences being significant at the 5%. This, once again, does not support the expectation expressed in Hypothesis 2.

The median abnormal accruals for the suspect group is higher and is significantly different from the median level for the rest of the sample, supporting Hypothesis 2, indicating that firm-years that beat prior-year's performance engaged in income-increasing accrual-based earnings manipulation. On the other hand, this study did not find any significant differences in the level of abnormal production costs and abnormal aggregate REM between the two groups.

Table 5: Mean Median REM and AEM Proxies: A Comparison between Suspect Changes in EPS (SuschaEPS) Firm-Years and the Rest of the Sample

	SuschaEPS firm-years		Rest of the sample		Difference	
	Mean	Median	Mean	Median	Means (t-statistics)	Medians (z-statistics)
<i>AB CFO</i>	0.021	0.016	-0.005	0.004	0.026** (2.44)	0.012** (2.05)
<i>AB PROD</i>	0.007	0.026	-0.001	0.012	0.008 (0.47)	0.014 (0.73)
<i>AB DIS</i>	-0.049	-0.076	0.002	-0.038	-0.051*** (-3.41)	-0.038*** (-4.10)
<i>AB AGG</i>	-0.038	-0.068	-0.006	-0.044	-0.032 (-0.95)	-0.024 (-1.33)
<i>AB ACC</i>	0.013	0.026	-0.003	0.011	0.016 (1.44)	0.015* (1.94)

***Significant at 1% level. **Significant at 5% level. *Significant at 10% level, two-tailed. The numbers in parenthesis are *t*-statistics from the two-group mean comparison test, and *z*-statistics from the Wilcoxon rank-sum test.

Variable description: Please see Appendix I for variable descriptions.

5.2 Multivariate models to test the association between REM and firm-years that meet small positive earnings and sustain last year's performance in the form of EPS

This section presents the multivariate models employed to examine the existence of real earnings management (REM) and the presence of accrual earnings management (AEM) during the years they are meeting and beating small earnings benchmarks. Prior studies suggest that the magnitude of the REM and AEM measures are highly correlated with firm performance indicators, the level of growth opportunities, firm size, leverage usage and incentives to avoid debt covenant restrictions. Therefore, if there are any observed group differences in the mean and median proxies of REM and AEM across the suspect firm-years in the univariate analysis, they may not necessarily be associated with earnings manipulation across the years firms are meeting and beating earnings thresholds. Therefore, the second form of analysis uses ordinary least squares (OLS) regression estimation to examine the existence of REM and AEM in the year of meeting and beating earnings thresholds, after controlling for the above explanatory variables.

This study estimates pooled ordinary least square (OLS) regression models and computes the t-statistics using robust standard errors correcting for clustering at the firm level. Kraft et al. (2007) suggest that, in accounting research, OLS offers several distinct advantages where the sample size is large, including being better understood and easier to instrument, open to including additional explanatory variables, and allowing academics to address econometric issues by using methodologies based on clustered standard errors.¹⁶ In addition, Petersen (2009) documents that OLS clustered standard errors are unbiased when residuals are independent and identically distributed, because of the residual dependence produced by the firm effect.¹⁷ Following Petersen (2009), Gunny (2010) also used pooled regression and computed t-tests using Roger's robust standard errors, correcting for firm clustering, to examine the association between benchmark beating and REM.

This investigation, assumes that the proxies for REM and AEM are exogenous variables, when assessing the presence of REM and AEM across the years of firms meeting and/or beating earnings benchmarks. A similar assumption is also accepted by Gunny (2010)

¹⁶ Kraft et al. (2007) compared OLS and tests developed by Mishkin (1983), which are widely used in accounting research, and show that when additional independent variables are added the rational pricing of accruals are not rejected and the accrual anomaly evidenced by Sloan (1996) disappears.

¹⁷ Petersen (2009) show that both OLS and Fama-MacBeth standard errors are biased, the Newey-West standard errors are also biased but in a relatively small way, and only clustered standard errors are unbiased.

when examining the future operating performance of firms undertaking REM activities to meet and beat earnings benchmarks. However, she argues that, if REM is endogenously determined, then the results suffer from a potential correlated omitted variable bias. Therefore, in line with Gunny (2010), this study assumes that both REM and AEM are restrictive on an earnings manipulation incentive to moderate the effects of alternative justifications.

To test Hypotheses 1 and 2 relating to whether the firm-years that report small positive earnings and sustain prior year's earnings (suspect firm-years) exhibit a significant difference from the rest of the sample in terms of REM activity, the following equation is estimated:

$$AB_REM_t = \gamma_0 + \gamma_1 ROA_t + \gamma_2 MTB_{t-1} + \gamma_3 Size_{t-1} + \gamma_4 LEV_{t-1} + \gamma_5 Audit_dummy_t + \gamma_6 Suspect_t + \sum_{N=1}^n \gamma_N Year_dummies_t + \varepsilon_t \quad (6)$$

Equation 6 regress four proxies of REM on the suspect firm indicator variables *SusEPS_t*, and *SuschaEPS_t*, (*mutually exclusively*) and control variables.

To test Hypotheses 1 and 2 addressing whether the suspect firm-years demonstrate a significant departure from the rest of the sample in AEM engagement, the following equation is estimated:

$$AB_AEM_t = \gamma_0 + \gamma_1 ROA_t + \gamma_2 MTB_{t-1} + \gamma_3 Size_{t-1} + \gamma_4 LEV_{t-1} + \gamma_5 Audit_dummy_t + \gamma_6 Suspect_t + \sum_{N=1}^n \gamma_N Year_dummies_t + \varepsilon_t \quad (7)$$

Equations 7 regresses the proxy of AEM on the suspect firm indicator variables *SusEPS_t*, and *SuschaEPS_t*, (*mutually exclusively*) and control variables.

Variable descriptions: Please see Appendix 1 for variable descriptions.

5.2.1 Expected sign on the indicator variables when the dependent variables are the measures of REM and AEM

If the managers of the firms, in the year of reporting small positive earnings and small positive changes in earnings intentionally participate in sales manipulation by offering price discounts and compassionate credit terms to temporarily increase sales then the coefficient on the indicator variables (*SusEPS_t*, and *SuschaEPS_t*) are expected to be negative when the dependent variable is abnormal cash flow from operations (AB_CFO). When the dependent variable is abnormal production costs (AB_PROD), if the managers deliberately engaged in overproduction in the year of meeting and beating earnings

threshold to reduce per unit products costs, and to satisfy the additional demand created as a result of offering price discounts and more lenient credit terms then the coefficient on the indicator variables are expected to be positive.

If they adjust (reduce) discretionary expenses to avoid losses or to reports small increase in earnings relative to the prior year, then the coefficient on the indicator variables are expected to be negative when the dependent variable is the AB_DIS. For aggregate real earnings management, the coefficient on the binary variables are also expected to be negative as the abnormal production cost is multiplied by (-1) to estimate the AB_AGG variable.

From the discretionary accruals perspective, if the managers of the benchmark meeting and beating firm-years taking the opportunistic advantage of GAAP undertake AEM that adversely affects or increases the discretionary or abnormal accruals, then the coefficient on the indicator variables are expected to be positive when the dependent variable is the AB_ACC.

5.2.2 Control variables

This research includes control variables based on prior studies. This study incorporates firm performance as a control variable because prior studies suggest that measurement errors in estimating discretionary accruals (AEM) are correlated with firm performance (Dechow et al., 1995; Kasznik, 1999; and McNichols, 2000).¹⁸ Following prior studies, this paper includes growth opportunities, represented by the market to book value ratio (MTB_{t-1}), as a control variable. Previous empirical examination documents that rapidly growing firms are more likely to be associated with earnings management (Matsumoto, 2002 and McNichols, 2000). In addition, Skinner and Sloan (2002) identify that firms with growth prospects are penalized more by the investors in the market; therefore, managers of high-growth firms are likely to have incentives to avoid negative earnings.¹⁹

The political cost hypothesis predicts that large firms (firms that are subject to political attention) are more likely to use accounting adoptions that result in an understatement of

¹⁸ They recommend that the inclusion of a firm performance variable in the earnings management regression can lessen the above problem. Recent studies examining the use of REM, in the context of meeting or beating benchmark (Roychowdhury, 2006; Gunny, 2010; and Zang, 2012), and in the setting of SEOs (Cohen and Zarowin, 2010), also include firm performance (ROA) as a control variable to mitigate the effect of estimation error associated with the partitioning variable (proxies for REM).

¹⁹ Furthermore, Roychowdhury (2006) finds that managers of the suspect firm-years with high market-to-book value ratio engaged in REM, and reveals that these firm-years have abnormal production costs that are higher and abnormal discretionary expenses that are lower, on average, relative to rest of the suspect-firm years.

reported earnings, because of reduced flexibilities and fragile incentives to overstate earnings (Watts and Zimmerman, 1990). However, Lobo and Zhou (2006) propose that large firms are likely to have higher incentives and opportunities to overstate reported earnings because their operational activities are complex, and the difficulty faced by outsiders in detecting such overstatement. This examination further comprises size as a control variable to control for systematic dissimilarity in proxies for REM and AEM.

Moreover, this paper incorporates leverage as a control variable because the debt covenant hypothesis indicates that managers have motivations to make financial reporting choices that lessen the possibility that accounting-based covenants in their firms' debt agreements will be violated (Dichev and Skinner, 2002 and Dechow et al., 1996). As a controlling device, debt may stimulate the earnings management behaviour of the managers of the firms. DeFond and Jiambalvo (1994) document that managers use discretionary accruals to satisfy debt covenants constraints.

This analysis also introduces year dummies in the regression model to control for fixed year effects. These variables control for differences in earnings management practices between the years. These year dummy variables also control for specific events or shocks common to all firms that may impact on firm accounting policy and decision making.

5.2.3 Correlation between the Dependent and Independent Variables

The correlation coefficients between the continuous variables are reported in Table 6. Following prior studies, the correlations between continuous variables and indicator variables are not reported in Table 6.

Panel A of Table 6 reports the Pearson correlation coefficients for the earnings management measures and for the explanatory variables. The table presents that the abnormal cash flow from operations (AB_CFO_t) and abnormal accruals (AB_ACC_t) variables are strongly positively correlated with return on assets (ROA_t), with the correlation coefficients being significant at the 1% level. However, abnormal production costs (AB_PROD_t) and abnormal discretionary expenses (AB_DIS_t) are negatively correlated with ROA_t at the 1% significance level. The AB_CFO_t and AB_DIS_t variables are significantly positively correlated with lagged market to book value ratio (MTB_{t-1}), and AB_PROD_t is significantly negatively correlated with MTB_{t-1} , whereas, no significant correlation between AB_ACC_t and MTB_{t-1} is observed.

Table 6: Pearson and Spearman Correlation Matrix

<i>Panel A: Pearson correlation matrix</i>							
	ROA_t	MTB_{t-1}	$Size_{t-1}$	LEV_{t-1}	AB_CFO_t	AB_PROD_t	AB_DIS_t
MTB_{t-1}	-0.045**						
$Size_{t-1}$	0.325***	0.209***					
LEV_{t-1}	-0.142***	-0.114***	-0.086***				
AB_CFO_t	0.397***	0.032*	0.043**	-0.100***			
AB_PROD_t	-0.161***	-0.078***	-0.091***	0.038**	-0.286***		
AB_DIS_t	-0.065***	0.088***	0.073***	-0.029	-0.180***	-0.569***	
AB_ACC_t	0.398***	0.022	0.036**	0.077***	-0.123***	-0.010	-0.038**
<i>Panel B: Spearman correlation matrix</i>							
	ROA_t	MTB_{t-1}	$Size_{t-1}$	LEV_{t-1}	AB_CFO_t	AB_PROD_t	AB_DIS_t
MTB_{t-1}	0.207***						
$Size_{t-1}$	0.401***	0.398***					
LEV_{t-1}	0.099***	-0.041**	0.026				
AB_CFO_t	0.396***	0.083***	0.054***	-0.097***			
AB_PROD_t	-0.254***	-0.140***	-0.133***	0.040**	-0.334***		
AB_DIS_t	0.027	0.171***	0.127***	-0.053***	-0.153***	-0.494***	
AB_ACC_t	0.301***	0.055***	0.040**	0.060***	-0.185***	0.003	-0.014

***Significant at 1% level. **Significant at 5% level. *Significant at 10% level, two-tailed. All variables are winsorized at the top and bottom 1% level before estimating the correlation coefficients to remove the influence of outliers.

Variable description: Please see Appendix 1 for variable descriptions.

The AB_CFO_t , AB_DIS_t , and AB_ACC_t variables are positively correlated with the lagged size of the firm ($Size_{t-1}$), with the correlation coefficients being significantly different from zero; however, AB_PROD_t is significantly negatively correlated with $Size_{t-1}$. AB_CFO_t is strongly negatively correlated with the lagged leverage (LEV_{t-1}) of firms, whereas, AB_PROD_t and AB_ACC_t are positively correlated to LEV_{t-1} and the correlation coefficients are significantly different from zero. AB_DIS_t is negatively correlated with the LEV_{t-1} variable; however, the correlation coefficient is not significant.

Among the REM and AEM proxies, AB_CFO_t is significantly negatively correlated to AB_PROD_t , AB_DIS_t , and AB_ACC_t , representing correlations which are consistent with

prior studies.²⁰ AB_PROD_t is strongly negatively correlated with AB_DIS_t , with the correlation coefficient being significant at the 1% level. This suggests that managers of firms are involved in REM activities which lead to abnormally higher production costs and, at the same time, they are reducing discretionary expenses to achieve a certain income-increasing earnings benchmark.²¹ The AB_PROD_t and AB_ACC_t variables are not significantly correlated; in contrast, AB_DIS_t is negatively correlated with AB_ACC_t and the correlation is significant at the 5% level. Following Roychowdhury (2006) and Cohen and Zarowin (2010), this study infers the significant negative correlations between (AB_ACC_t and AB_CFO_t) and (AB_ACC_t and AB_DIS_t) as evidence that the manager of firms engaged in both accrual and real earnings management activities.

Between the independent variables, ROA_t is negatively correlated with the growth opportunities (MTV_{t-1}) and LEV_{t-1} variables; however, it is strongly and significantly positively correlated with the $Size_{t-1}$ variable. The MTV_{t-1} variable is negatively correlated with the LEV_{t-1} variable and is strongly positively correlated with the $Size_{t-1}$ variable. On the other hand, $Size_{t-1}$ is significantly negatively correlated with the LEV_{t-1} variable. The correlation coefficients among the independent variables are relatively small, except for between ROA_t and $Size_{t-1}$, indicating that multicollinearity should not be problematic for the regression analysis using Equations 6 and 7.

This examination also estimates the Spearman rank correlation coefficients (Panel B of Table 6). Findings based on Spearman rank correlations are mostly similar to the Pearson correlation coefficients, with a few exceptions. Spearman rank correlations show that MTB_{t-1} is significantly positively correlated with subsequent firm profitability (ROA_t) (0.176) and the correlation between AB_CFO_t and AB_ACC_t (-0.185) is much higher than the equivalent Pearson correlation coefficient and is statistically significant, which is similar to prior studies. In addition, LEV_{t-1} and AB_DIS_t are not significantly correlated with ROA_t in the Spearman correlation coefficients, along with no significant correlation between the AB_DIS_t and AB_ACC_t variables.

5.2.4 Multivariate results

5.2.4.1 Firm-Years Reporting Small Positive Earnings in the form of Earnings per Share (SusEPS)

Table 7 presents the results of pooled cross-sectional regressions for the four proxies of REM, and for the proxy of AEM, to test Hypotheses 1 relating to SusEPS firm-years. An

²⁰ Similar results are provided by Roychowdhury (2006); Cohen and Zarowin (2010); Gunny (2010); and Zang (2012). However, the magnitude of the correlation coefficient between AB_CFO and AB_ACC are generally much higher than the coefficient found in this study.

²¹ Prior studies explain the correlation coefficient between AB_PROD and AB_DIS in that way Roychowdhury (2006); Cohen and Zarowin (2010); Gunny (2010); and Zang (2012).

examination of the table results suggest that the managers of the suspect EPS firm-years (SusEPS) are engaged in production cost manipulation, discretionary expense manipulation, greater level of real earnings management, and accrual-based earnings management relative to the rest of the sample firm-years.

The first column of Table 7 shows the relation between abnormal cash flow from operations (AB_CFO_t) and the indicator for suspect EPS ($SusEPS_t$) firm-years after controlling for other variables that may influence the magnitude of the AB_CFO variable. The coefficient on $SusEPS_t$ is positive (0.0013), and is not significantly different from zero, suggesting that the managers of SusEPS firm-years are not engaged in sales manipulation. However, a significant association between the AB_CFO_t and the ROA_t , MTB_{t-1} and $Size_{t-1}$ variables is evident.

Table 7: Pooled Cross-Sectional Regressions Relating Abnormal Residuals to Firms Meeting Zero Earnings Benchmark in the form of Earnings per Share (EPS): A Comparison between Suspect EPS Firm-Years (SusEPS) and the Rest of the Sample

	I	II	III	IV	V
	AB_CFO_t	AB_PROD_t	AB_DIS_t	AB_AGG_t	AB_ACC_t
<i>Intercept</i>	0.0507**	0.0173	-0.0511*	-0.0224	0.0202
	(2.60)	(0.55)	(-1.69)	(-0.38)	(0.93)
ROA_t	0.2212***	-0.1382***	-0.0810**	0.3086***	0.2438***
	(9.32)	(-5.30)	(-2.50)	(5.89)	(10.84)
MTB_{t-1}	0.0029	-0.0076***	0.0058**	0.0168***	0.0051***
	(1.59)	(-3.04)	(2.22)	(3.60)	(3.60)
$Size_{t-1}$	-0.0109***	0.0013	0.0066	-0.0054	-0.0113***
	(-3.67)	(0.22)	(1.34)	(-0.49)	(-4.73)
LEV_{t-1}	-0.0104	0.0046	-0.0247	-0.0520	0.0691***
	(-0.51)	(0.20)	(-1.03)	(-1.23)	(2.84)
<i>Audit dummy_t</i>	-0.0040	-0.0292	0.0362*	0.0612	-0.0097
	(-0.33)	(-1.07)	(1.69)	(1.25)	(-0.96)
$SusEPS_t$	0.0013	0.0491*	-0.0460**	-0.0886*	0.0246**
	(0.09)	(1.71)	(-2.10)	(-1.75)	(2.11)
<i>Year dummies</i>	YES	YES	YES	YES	YES
<i>No. of Observation</i>	3166	2904	3438	2895	3147

****Significant at 1% level. **Significant at 5% level. *Significant at 10% level, two-tailed. The t-statistics are computed using robust standard errors clustered at the firm level. All continuous variables are winsorized at the top and bottom 1% level to minimize the influence of outliers.*

$$a) AB_REM_t = \gamma_0 + \gamma_1 ROA_t + \gamma_2 MTB_{t-1} + \gamma_3 Size_{t-1} + \gamma_4 LEV_{t-1} + \gamma_5 Audit_dummy_t + \gamma_6 SusEPS_t + \sum_{N=1}^n \gamma_N Year_dummies_t + \varepsilon_t$$

$$b) AB_AEM_t = \gamma_0 + \gamma_1 ROA_t + \gamma_2 MTB_{t-1} + \gamma_3 Size_{t-1} + \gamma_4 LEV_{t-1} + \gamma_5 Audit_dummy_t + \gamma_6 SusEPS_t + \sum_{N=1}^n \gamma_N Year_dummies_t + \varepsilon_t$$

Regression model (a) is estimated for the four proxies of real earnings management as the dependent variable and the coefficient estimates are shown in the first four columns of the above table, and regression model (b) is estimated for the proxy of accrual earnings management and the coefficient estimates are shown in the final column of the above table. The sample consists of firm-year observations from 2003 to 2010 for AB_CFO, AB_DIS and AB_ACC, and from 2004 to 2010 for AB_PROD and AB_AGG.

Variable description: Please see Appendix 1 for variable descriptions.

When the dependent variable is abnormal production costs (AB_PROD_t), the coefficient estimate on the $SusEPS_t$ variable is 0.0491 and is significant at the 10% level, indicating that the managers of the suspect EPS firm-years are involved in production costs manipulation to reach a zero earnings threshold. This result supports the proposition of Hypothesis 1. Column 2 of Table 7 presents that the AB_PROD_t variable is significantly negatively associated with firm performance and growth opportunities of the firm, revealing that less profitable firms and lower growth firms have higher abnormal production costs, controlling for other firm attributes.

Column 3 of Table 7 presents that the coefficient on the $SusEPS_t$ variable is negative (-0.0460), and is statistically significant at the 5% level, when the dependent variable is abnormal discretionary expenses (AB_DIS_t), suggesting that SusEPS firm-years have discretionary expenses that are lower, on average, by 4.60% of total assets relative to the rest of the sample firm observations. This result implies that firms engage in income-increasing REM activities to reach zero earnings benchmarks, and supports Hypothesis 1. The association between the AB_DIS_t variable and the control variables is also significantly different from zero, except for the lagged Size and leverage (LEV_{t-1}) variables. The coefficient on the ROA_t variable is -0.0810, 0.0058 for the MTB_{t-1} variable and 0.0362 for the $Audit_dummy_t$ variable, suggesting that more profitable firms have lower level of abnormal discretionary expenses and, on the other hand, growing firms have higher degrees of abnormal discretionary expenses relative to the other firms, and the presence of a Big-4 audit firm restricts the managers' opportunity to reduce discretionary expenses.

The coefficient on the $SusEPS_t$ variable is negative (-0.0886) when the dependent variable is abnormal aggregate REM (AB_AGG_t), and is significantly different from zero. This negative coefficient on $SusEPS_t$ is consistent with significant REM in at least one of the three forms being present and indicates that managers of suspect EPS firm-years are engaged in greater levels of overall REM activities to avoid losses. AB_AGG_t is also significantly positively associated with the ROA_t and $MTBt_{-1}$ variables, along with an insignificant association with firm size, the proportion of leverage in the firm's capital structure and the employment of well-known auditors.

The final column of Table 7 shows that firms meeting the zero-EPS benchmark are involved in higher levels of accrual-based earnings management (AB_ACC_t). The coefficient estimate on the $SusEPS_t$ variable is positive (0.0246) with a t-statistic of 2.11, indicating that suspect firm-years have discretionary or abnormal accruals that are higher, on average, by 2.46% of assets relative to the rest of the sample, and provides support for Hypothesis 5. Consistent with prior studies, the final column presents that abnormal accruals are strongly positively associated with firm performance, firm growth opportunities, and leverage usage, and significantly negatively associated with the size of the firm. These results confirm that profitable, growing and increasingly levered firms have higher levels of discretionary accruals and larger firms have lower level of discretionary accruals relative to other firms.

5.2.4.2 Firm-Years Reporting Small Increases in Earnings in the form of Changes in Earnings per Share ($SuschaEPS$)

Table 8 exhibits that firm-years that report small increases in earnings per share (EPS) compared to the prior year are engaged in income-increasing discretionary expense manipulation and accrual earnings management. However, this study also finds that these firms are also engaged in income-decreasing earnings manipulation, based on the outcomes for the AB_CFO_t dependent variable model.

When the dependent variable is abnormal discretionary expense (AB_DIS_t), the coefficient on the $SuschaEPS_t$ variable is -0.0504 and is significant at the 1% level, indicating that firm-years that sustain the prior year's performance have abnormal discretionary expenses, which are lower, on average, by 5.04% of assets relative to the rest of the sample, and supports Hypothesis 2. The coefficient on the $SuschaEPS_t$ variable is positive and significantly different from zero, with a t-statistic of 3.26, when the dependent variable is abnormal accruals (AB_ACC_t), suggesting that this group of firm-years have abnormally higher accruals, on average, by 3.89% of assets compared to the non-suspect group of firm-years and provides support for Hypothesis 2.

However, when the dependent variable is abnormal cash flow from operations (AB_CFO_t) the coefficient on the $SuschaEPS_t$ variable is significantly positive (0.0475),

indicating that the managers are engaged in REM activities to bias earnings downward. The coefficients on the $SuschaEPS_t$ variable are not significantly different from zero when the dependent variables are abnormal production cost and abnormal aggregate REM, suggesting that firms reporting small increases in earnings relative to the prior-year in the form of EPS are not engaged in production cost manipulation or in greater levels of overall REM activities.

Variance inflation factors (VIFs) are computed after estimating Equations 6 and 7, (for the two groups of suspect firm-years) for the independent variables to check for multicollinearity concerns. The VIFs for the independent variables (except the year dummies) used in Equations 6 and 7, for models involving all four proxies of REM and the proxy of AEM, are less than 2. For the year dummy variables in Equation 6, the VIFs are less than 3. However, the VIFs for the year dummies in Equation 7 are more than 10. Therefore, the models were re-estimated excluding the year dummy variables, and no significant differences in the coefficients relative to the coefficients presented in the final column of Tables 7, and 8 were identified. Therefore, multicollinearity does not appear to be a concern in this study.

Table 8: Pooled Cross-Sectional Regressions Relating Abnormal Residuals to Firms Beating Zero Earnings Threshold in the form of Small Changes in EPS: A Comparison between Suspect Changes in EPS Firm-Years (SuschaEPS) and the Rest of the Sample

	I	II	III	IV	V
	AB_CFO_t	AB_PROD_t	AB_DIS_t	AB_AGG_t	AB_ACC_t
<i>Intercept</i>	0.0436*	0.0291	-0.0463	-0.0552	0.0009
	(1.84)	(0.96)	(-1.58)	(-1.03)	(0.04)
ROA_t	0.2244***	-0.1332***	-0.0900***	0.2975***	0.2497***
	(9.67)	(-5.25)	(-2.84)	(5.83)	(11.27)
MTB_{t-1}	0.0027	-0.0077***	0.0061**	0.0168***	0.0051***
	(1.46)	(-3.05)	(2.28)	(3.56)	(3.55)
$Size_{t-1}$	-0.0094***	-0.0003	0.0065	-0.0023	-0.0109***
	(-3.33)	(-0.04)	(1.37)	(-0.21)	(-4.69)
LEV_{t-1}	-0.0096	0.0054	-0.0272	-0.0545	0.0707***
	(-0.48)	(0.24)	(-1.15)	(-1.29)	(2.87)
<i>Audit dummy_t</i>	-0.0041	-0.0294	0.0358*	0.0606	-0.0098
	(-0.34)	(-1.07)	(1.66)	(1.24)	(-0.98)
$SuschaEPS_t$	0.0475***	-0.0095	-0.0504***	0.0076	0.0389***
	(3.82)	(-0.53)	(-2.79)	(0.21)	(3.26)
<i>Year dummies</i>	YES	YES	YES	YES	YES
<i>No. of Observation</i>	3155	2896	3424	2887	3136

***Significant at 1% level. **Significant at 5% level. *Significant at 10% level, two-tailed. The *t*-statistics are computed using robust standard errors clustered at the firm level. All continuous variables are winsorized at the top and bottom 1% level to minimize the influence of outliers.

$$a) AB_REM_t = \gamma_0 + \gamma_1 ROA_t + \gamma_2 MTB_{t-1} + \gamma_3 Size_{t-1} + \gamma_4 LEV_{t-1} + \gamma_5 Audit_dummy_t + \gamma_6 SuschaEPS_t + \sum_{N=1}^n \gamma_N Year_dummies_t + \varepsilon_t$$

$$b) AB_AEM_t = \gamma_0 + \gamma_1 ROA_t + \gamma_2 MTB_{t-1} + \gamma_3 Size_{t-1} + \gamma_4 LEV_{t-1} + \gamma_5 Audit_dummy_t + \gamma_6 SuschaEPS_t + \sum_{N=1}^n \gamma_N Year_dummies_t + \varepsilon_t$$

Regression model (a) is estimated for the four proxies of real earnings management as the dependent variable and the coefficient estimates are shown in the first four columns of the above table, and regression model (b) is estimated for the proxy of accrual earnings management and the coefficient estimates are shown in the final column of the above table. The sample consists of firm-year observations from 2003 to 2010 for *AB_CFO*, *AB_DIS* and *AB_ACC*, and from 2004 to 2010 for *AB_PROD* and *AB_AGG*.

Variable description: Please see Appendix 1 for variable descriptions.

This examination also incorporated further sensitivity tests (un-tabulated) using contemporaneous control variables, namely the market to book value ratio at the end year *t* (*MTB_t*), size at the end of year *t* (*Size_t*), and leverage at end of year (*LEV_t*). In these models, the coefficients on the *Suspect_t* variable (for the four groups of suspect firm-years) are relatively similar to the lagged control variable models, with one exception; when the dependent variable is abnormal discretionary expenses (*AB_DIS_t*) the coefficient on *Suspect_t* (suspect EPS firm-years) is -0.0364 with a *t*-statistic of 1.64.

5.3 Further Analyses and Robustness Checks

5.3.1 Performance Matching

Prior studies suggest that measurement errors in estimating discretionary accruals (AEM) are correlated with firm performance (Dechow et al., 1995 and Kasznik, 1999). They document that discretionary or abnormal accruals estimated by the Jones (1991) model are significantly positively associated with the return on assets (*ROA*). To mitigate the problem of performance-related misspecification, some studies remove the potential effects of this correlation between performance and abnormal accruals by employing a matched control firm or portfolio technique to adjust abnormal or unexpected accruals (Kasznik, 1999; Bartov et al, 2001; Marquardt and Wiedman, 2004; and Taylor and Xu, 2010).

However, Kothari et al. (2005) propose a performance-matched discretionary accrual estimation model that includes an additional control variable for the firm's performance (lagged return on assets, *ROA_{t-1}*), in addition to an intercept (inverse of firm size, *1/TA_{t-1}*)

term to overcome the problematic heteroskedasticity and misspecification problem of the Jones (1991) model in estimating abnormal accruals. They argue that this model is a form of alternative for the control sample approach, and is both well specified and powerful at estimating abnormal accruals.

Since this study does not include performance-matched control firms, therefore, following Kothari et al. (2005), the abnormal components of REM and AEM are re-estimated using the following models to test the reliability of the primary results.

Normal Level of Cash Flow from Operations:

$$CFO_t / TA_{t-1} = \gamma_0 + \gamma_1 1 / TA_{t-1} + \gamma_2 SA_t / TA_{t-1} + \gamma_3 \Delta SA_t / TA_{t-1} + \gamma_4 ROA_{t-1} + \varepsilon_t \quad (8)$$

Normal Level of Production Costs

$$PROD_t / TA_{t-1} = \gamma_0 + \gamma_1 1 / TA_{t-1} + \gamma_2 SA_t / TA_{t-1} + \gamma_3 \Delta SA_t / TA_{t-1} + \gamma_4 \Delta SA_{t-1} / TA_{t-1} + \gamma_5 ROA_{t-1} + \varepsilon_t \quad (9)$$

Normal Level of Discretionary Expenses

$$DIS_t / TA_{t-1} = \gamma_0 + \gamma_1 1 / TA_{t-1} + \gamma_2 SA_{t-1} / TA_{t-1} + \gamma_3 ROA_{t-1} + \varepsilon_t \quad (10)$$

The performance-matched abnormal cash flow from operations (*PAB_CFO*), abnormal production costs (*PAB_PROD*), and abnormal discretionary expenses (*PAB_DIS*) are then estimated as a deviation of the normal cash flow from operations from the actual cash flow from operations, normal production costs from the actual production costs, normal discretionary expenses from the actual discretionary expenses respectively, and normal accruals from the actual accruals.

The abnormal level of aggregate REM (*PAB_AGG*) is then estimated using the following equation. *PAB_PROD* is multiplied by minus one in estimating *PAB_AGG*, so that lower values of *PAB_AGG* are consistent with greater levels of earnings management using real activities manipulation.

$$PAB_AGG = PAB_CFRO + PAB_DIS + PAB_PROD*(-1) \quad (11)$$

Normal Level of Accruals

$$ACC_t / TA_{t-1} = \gamma_0 + \gamma_1 1 / TA_{t-1} + \gamma_2 \Delta SA_t / TA_{t-1} + \gamma_3 PPE_t / TA_{t-1} + \gamma_4 ROA_{t-1} + \varepsilon_t \quad (12)$$

The abnormal level of accruals (*PAB_ACC*) is then estimated as a deviation of the level of normal accruals from the actual accruals. After estimating the performance-matched measures of REM and AEM, Equation 8 and 9 are used to assess the presence of REM and AEM among the different groups of suspect firm-years.

Variable Descriptions: Please see Appendix 1 for variable descriptions.

5.3.2 Earnings Benchmarks and the Presence of Performance-Matched REM and AEM

Table 9 reproduces the primary model results provided in Tables 7 and 8 for the two representations of suspect firm years using the performance-matched measures of real earnings management and accrual-based earnings management. Since the performance-matched proxies are estimated controlling for lagged returns on asset, these models are based on a smaller number of observations than was used for the original model estimation.

Table 9: Robustness Checks Using Pooled Cross-Sectional Regressions Relating Performance-Matched Abnormal Residuals to Suspect Firms Meeting and/or Beating Earnings Benchmarks: A Comparison between Suspect Firm-Years and the Rest of the Sample

	I	II	III	IV	V
	PAB_CFO_t	PAB_PROD_t	PAB_DIS_t	PAB_AGG_t	PAB_ACC_t
<i>Panel A: Firms reporting small positive earnings in the form of earnings per Share (SusEPS)</i>					
<i>Control variables</i>	YES	YES	YES	YES	YES
<i>SusEPS_t</i>	-0.0074	0.0457*	-0.0381*	-0.0929*	0.0344***
	(-0.56)	(1.68)	(-1.71)	(-1.83)	(3.03)
<i>No. of Observation</i>	2978	2903	2998	2894	2959
<i>Panel B: Firms reporting a small increases in earnings in the form of changes in EPS (SuschaEPS)</i>					
<i>Control variables</i>	YES	YES	YES	YES	YES
<i>SuschaEPS_t</i>	0.0385***	-0.0093	-0.0344*	0.0089	0.0397***
	(3.64)	(-0.53)	(-1.83)	(0.26)	(3.59)
<i>No. of Observation</i>	2969	2895	2989	2886	2950

****Significant at 1% level. **Significant at 5% level. *Significant at 10% level, two-tailed. The t-statistics are computed using robust standard errors correcting for firm clusters. All control variables are winsorized at top and bottom 1 percent level.*

$$a) PAB_REM_t = \gamma_0 + \gamma_1 ROA_t + \gamma_2 MTB_{t-1} + \gamma_3 Size_{t-1} + \gamma_4 LEV_{t-1} + \gamma_5 Audit\ dummy_t + \gamma_6 Suspect_t + \sum_{N=1}^n \gamma_N Year\ dummies_t + \varepsilon_t$$

$$b) PAB_AEM_t = \gamma_0 + \gamma_1 ROA_t + \gamma_2 MTB_{t-1} + \gamma_3 Size_{t-1} + \gamma_4 LEV_{t-1} + \gamma_5 Audit\ dummy_t + \gamma_6 Suspect_t + \sum_{N=1}^n \gamma_N Year\ dummies_t + \varepsilon_t$$

Regression model (a) is estimated for the four proxies of performance-matched real earnings management as the dependent variable and the coefficient estimates are shown in the first four columns of the above table, and regression model (b) is estimated for the proxy of performance-matched accrual earnings management as the dependent variable and the coefficient estimates are shown in the final column of the above table.

Variable description: Please see Appendix 1 for variable descriptions.

The results presented in Table 9 are generally consistent with the primary results presented in the above tables, with a few exceptions. The coefficient on the *SusEPS_t* variable is lower in comparison to the primary result and is only significant at the 10% level when the dependent variable is performance-matched discretionary expense (*PAB_DIS_t*). In addition, the coefficient estimate on *SuschaEPS* is not significantly different from zero when the dependent variable is performance-matched aggregate REM.

6. Conclusion

The benefits from managing earnings are directly related to the motivation behind the earnings management activity. Extant research related to prospect theory and psychological theory, in association with related empirical evidence, suggest that managerial incentives increase when earnings are close to certain earnings benchmarks, because behavioral theory exhibits that investors follow simple assessment or performance heuristics such as zero earnings, beating or sustaining last year's earnings, and meeting or beating analysts' estimates. This examination, therefore, selects the first two settings from the earnings management literature where the incentives for managing earnings seem to be greatest.

Most of the literature on earnings management is based on the US market. Australian evidence is relatively scarce in comparison. For Australia, only a few papers have addressed the issue of earnings management and are limited to the investigation of accrual earnings management (AEM) around the earnings thresholds. This examination extends the prior research and provides a comprehensive examination of two types of earnings management (REM and AEM) and their association with earnings benchmarks in Australia.

The multivariate results show that, after controlling for variables that may influence the magnitude of REM and AEM the findings of this study indicates that managers of Australian firms that meet and zero earnings benchmarks in the form of earnings per share at the annual level tend to engage in REM in the years of meeting and beating zero earnings thresholds. Consistent with the propositions, the multivariate results document abnormally higher production costs and abnormally lower discretionary expenses in these years and abnormally higher discretionary accruals.

These deliberate managerial actions, in the form of REM and AEM, artificially mask the real value of the firm's assets, financial performance, and do not reflect the true and fair value of the firm. Since earnings management could affect the quality of accounting information by producing less reliable financial statements, eventually it could cause negative economic consequences for investors, managers, and other potential stakeholders.

APPENDIX 1: Variable Definition – in Chronological Order

<i>Variable</i>	<i>Definition</i>
$1/TA_{t-1}$	<i>Represents the lagged inverse of total assets</i>
AB_ACC	<i>Represents the abnormal accruals</i>
AB_AGG	<i>Represents abnormal aggregate REM and is the sum of AB_CFO, AB_PROD, and AB_DIS (AB_PROD is multiplied by minus one to estimate the abnormal aggregate REM, so that lower values are consistent with higher amount of real earnings management)</i>
AB_CFO	<i>Represents abnormal cash flow from operations</i>
AB_DIS	<i>Represents abnormal discretionary expenses</i>
AB_PROD	<i>Represents abnormal production costs</i>
ACC_t	<i>Represents the accruals during the year t.</i>
ACC_t/TA_{t-1}	<i>Represents accruals to lagged total assets ratio</i>
$Audit\ dummy_t$	<i>Represents an indicator variable coded one if the firm-year has a Big-4 audit firm, and zero otherwise</i>
CFO_t	<i>Represents the cash flow from operations during the year t</i>
CFO_t/TA_{t-1}	<i>Represents cash flow from operations to lagged total assets ratio</i>
DIS_t	<i>Represents the discretionary expenses during the year t</i>
DIS_t/TA_{t-1}	<i>Represents discretionary expenses to lagged total assets ratio</i>
$EATBEX_t$	<i>Represents earnings after taxes but before extraordinary items</i>
EPS_t	<i>Represents earnings per share</i>
LEV_t	<i>Represents leverage and is calculated as total liabilities divided by lagged assets</i>
LEV_{t-1}	<i>Represents the total debt to total assets ratio at the beginning of year</i>
MTB_t	<i>Represents the market-to-book value ratio</i>
MTB_{t-1}	<i>Represents the lagged market to book value ratio</i>
MVE_t	<i>Represents the market value of equity</i>
PAB_AEM_t	<i>Represents the proxy for performance-matched AEM, abnormal accruals (PAB_ACC)</i>
PAB_ACC	<i>Represents performance-matched abnormal accruals</i>

<i>PAB_AGG</i>	<i>Represents performance-matched abnormal aggregate REM and is the sum of PAB_CFO, PAB_PROD, and PAB_DIS (PAB_PROD is multiplied by minus one to estimate the performance-matched abnormal aggregate REM, so that lower values are consistent with higher amount of real earnings management)</i>
<i>PAB_CFO</i>	<i>Represents performance-matched abnormal cash flow from operations</i>
<i>PAB_DIS</i>	<i>Represents performance-matched abnormal discretionary expenses</i>
<i>PAB_PROD</i>	<i>Represents performance-matched abnormal production costs</i>
<i>PAB_REM_t</i>	<i>Represents the four proxies of performance-matched REM, abnormal cash flow from operations (PAB_CFO), abnormal production costs (PAB_PROD), abnormal discretionary expenses (PAB_DIS), and abnormal aggregate REM (PAB_AGG)</i>
<i>PPE_t/TA_{t-1}</i>	<i>Represents the gross property plant and equipment during the year t scaled by lagged total assets</i>
<i>PROD_t</i>	<i>Represents the production costs during the year t</i>
<i>PROD_t/TA_{t-1}</i>	<i>Represents production costs to lagged total assets ratio</i>
<i>ROA_t</i>	<i>Represents the return on assets ratio and is calculated as EATBEX_t divided by lagged total assets</i>
<i>SA_t/TA_{t-1}</i>	<i>Represents sales to lagged total assets ratio</i>
<i>SA_{t-1}/TA_{t-1}</i>	<i>Represents the sales during the year t-1 scaled by lagged total assets</i>
<i>ΔSA_t/TA_{t-1}</i>	<i>Represents the changes in sales during the year t scaled by lagged total assets</i>
<i>ΔSA_{t-1}/TA_{t-1}</i>	<i>Represents the changes in sales during the year t-1 scaled by lagged total assets</i>
<i>Size_{t-1}</i>	<i>Represents the natural logarithm of lagged market value of equity</i>
<i>SusEPS_t</i>	<i>Represents an indicator variable coded one if the earnings per share (EPS) is in between \$0.00 and \$0.01, and zero otherwise</i>
<i>SuschaEPS_t</i>	<i>Represents an indicator variable coded one if changes in earnings per share (EPS) are greater than or equal to \$0.00 but less than \$0.01, and zero otherwise</i>
<i>TA_t</i>	<i>Represents total assets</i>
<i>TA_{t-1}</i>	<i>Represents lagged total assets</i>
<i>Year dummies</i>	<i>Represents a set of 8 year dummy variables for the AB_CFO, AB_DIS and AB_ACC sample (models); and represents a set of 7 year dummy variables for AB_PROD and AB_AGG sample (models)</i>

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