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Pre Managed Earnings Benchmarks and Earnings Management of Australian Firms

Lan Sun[1] & Subhrendu Rath[2]

Abstract

This study investigates benchmark beating behaviour and circumstances under which managers inflate earnings to beat earnings benchmarks. We show that two benchmarks, positive earnings and positive earnings change, are associated with earnings manipulation. Using a sample of Australian firms from 2000 to 2006, we find that when the underlying earnings are negative or below prior year's earnings, firms are more likely to use discretionary accruals to inflate earnings to beat benchmarks.

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Introduction

The issue of benchmarks in the context of earnings manipulation is a much investigated issue in accounting literature[3]. Burgstahler and Dichev (1997) investigate earnings management behaviour of firms and link it to earnings benchmarks: profits and earnings increase. Using distribution of earnings, they postulate that discontinuities around zero earnings and zero changes in earnings to be evidences of managers manipulating earnings to report profits and to sustain last year's earnings. Later studies of managers engaging in earnings management to meet or beat earnings targets have replicated this methodology of examining distribution of earnings with mixed results, casting doubts on validity of using distributions method to ascertain earnings management behaviour.

In addition to the mixed results shown by using the distribution of earnings, whether benchmark beating is caused by earnings manipulation remains an unresolved issue for at least two reasons. First, the assertion of causality between earnings management and benchmarks is based on *ex post* reported earnings. However, real managerial effort to meet benchmarks that results in improved firm performance cannot be distinguished from apparent earnings manipulation by examining reported earnings, especially for firms that are on the margins of benchmarks (Dechow, Richardson & Tuna 2003). Second, although earnings discontinuities are observable, the distribution of "normal earnings level" in the absence of managerial manipulation is not defined (Kerstein & Rai 2007). In fact, managerial discretion to beat earnings targets, in part at least, is conditional on the nature of true earnings, that is, pre-managed earnings. For example, managers may increase earnings to reach targets when pre-managed earnings are below benchmarks. Managers can also decrease earnings when pre-managed earnings are well above benchmarks in order to save some income to beat benchmarks in the future (known as income smoothing or 'cookie jar accounting') or when pre-managed earnings are at a level so far below target that management discretion or effort is insufficient to reach it so that accruals are used to deflate earning ('big bath accounting'). Besides these two reasons, econometric and measurement issues of what constitutes earnings manipulation also create problems in using the earnings discontinuities to establish evidence of earnings management per se.

In the Australian context, the issue of benchmark beating and its association with earnings management is also not settled. Holland and Ramsay (2003) examine earnings distribution at two benchmarks (zero earnings and increase or sustaining last year's earnings) to find greater than expected frequency of firms around small profits and small earnings increases, and fewer than expected small losses and small earnings decreases to draw inferences regarding earnings manipulations. However, Coulton, Coulton and Taylor (2005) do not find significant difference between discretionary accruals for the benchmark beating and 'just-miss' groups. As such, they suggest that caution is needed to interpret benchmark beating caused by earnings management, especially for 'just-miss' groups.

Based on this evidence in the Australian context, and the mixed evidence of benchmark beating in general, we are motivated to examine the behaviour of benchmark beating further. We extend Holland and Ramsay (2003) and Coulton et al. (2005) by investigating

[3] Notable studies among these are: Barua, Elliott and Finn (2006), Coulton et al. (2005), Dechow, Richardson and Tuna (2000), Dechow et al. (2003), Degeorge, Patell and Zeckhauser (1999), Durtschi and Easton (2005), Holland and Ramsay (2003), Jacob and Jorgensen, (2007), Kerstein and Rai (2007) and Plummer and Mest (2001)

whether managers manipulate earnings to meet or beat the same benchmarks: above-zero earnings (profits) and earnings increase (sustain prior year's earnings). However, we differentiate our research design by conditioning our analysis and results on benchmarks of 'pre-managed earnings'. We use pre-managed earnings as a measure of true earnings level of a firm and postulate that managers engage in earning manipulation only if the earnings are short of benchmark levels on an *ex ante* basis. Our focus on the examination of pre-managed earnings, to the extent that accruals are used on an ex-post basis to adjust earnings, is an *ex ante* condition under which firms seek to manipulate earnings. Our research design allows us to condition the earnings manipulation behaviour, either to increase or decrease earnings when pre-managed earnings are below or above these benchmarks.

In addition to shedding light on the link between earnings manipulation and benchmark, we refine the standard Jones model for several alternate measures of accrual measurement. Operating cash flows (McNichols & Wilson 1988) and relative earnings performances (Dechow, Sloan & Sweeney 1995) are identified to contribute to model misspecification in estimating discretionary accruals. In our study, we estimate discretionary accruals by using a variation of the Jones model with the change of operating cash flows as an additional variable. We employ the performance adjusted technique of Kasznik (1999) to adjust the effect of industry-wide relative earnings performance.

Our summary of results is as follows. We first find significant discontinuities in the distribution of reported earnings and changes in earnings. However, these discontinuities disappear when the earnings are purged of discretionary accruals. We then estimate frequency of firms achieving earnings targets with the aid of earnings manipulation. The result suggests that a relatively low level of earnings management takes place among the subset of Australian firms confronted with reporting earnings decreases and losses compared to that of U.S. Third, we find when pre-managed earnings are negative or below prior year's earnings, firms are more likely to exercise positive discretionary accruals to inflate earnings to beat earnings benchmarks.

The remainder of the paper is organised as follows. The second section is the literature review and hypothesis development; the third section discusses research design and methodologies; the fourth describes data and sample selection process; the fifth presents the empirical results and, the sixth section concludes the paper.

Prior Literature and Hypotheses

In an important study of earnings manipulation, Burgstahler and Dichev (1997) state two theories to provide rationales to avoid reporting earnings losses and decreases. Using transaction cost theory they suggest that firms who report losses or earnings decrease tend to face higher transactions costs from the firms' stakeholders. Further, the prospect theory postulates losses and gains are valued differently implying that a firm may realise the largest value increase when it turns an expected loss to a profit. In addition, negative earnings decrease affect firms' credit ratings and their cost of capital resulting in loss of firm value and imply further earnings decreases in future.

The role of benchmarks or targets is important for earnings manipulation. From an accounting perspective, income smoothing requires that to reduce fluctuation managers may use accruals to increase or decrease current reported earnings to match pre-determined earnings target levels. From the managerial incentive perspectives, however, earnings manipulation behaviour is generally based on the notion that managers are assumed to be wealth-maximisers

who recognise that their wealth is adversely impacted when their firms' reported earnings fail to achieve benchmarks. Balsam (1998) shows evidence that CEO cash compensation is associated with discretionary accruals and such association varies depending on the circumstance where positive discretionary accruals are used to achieve earnings benchmarks. Supporting this conjecture Healy (1985) finds that shareholders increase their monitoring when a firm fails to meet their benchmarks and Gaver , Gaver and Austin (1995) find managers are punished in the form of reduced compensation and an increased probability of dismissal. The compensation committees can also distinguish between the components of earning and reward managers when their discretionary behaviour achieves the firms' goals. Ke (2001) links beating profits and last year's earnings behaviour with CEOs' compensation and pointed out that CEO compensation incentive formed one set of economic determinants of benchmark beating behaviour. Matsunaga and Park (2001) found that CEO compensation would be reduced when a firm misses an earnings benchmark because the compensation committee may view this as a signal of poor management performance. In Australian annual reports, corporate earnings figure is widely used as a key indicator of business performance. Earnings are one of the first measures highlighted and most of executive's review will compare this year's earnings performance with those of previous years. Target Based Incentive Plans are the most common incentive schemes used in determining CEOs' compensation level (Holland & Ramsay 2003). These evidences strongly imply that accounting benchmarks matter for managerial behaviour and provide incentives to manipulate earnings.

It is a necessary condition that earnings manipulation is dependent on true earnings of a firm. After all, earnings manipulation is not necessary when true earnings are adequate for the current period. Researchers have modelled this conditionality in circumstances leading to earnings manipulation. Fundengerg and Tirole (1995) present a theory that under the threat of CEO dismissal, a manager's decision to shift earnings is based on the firm's pre-managed earnings performance. They predict managerial action to shift future earnings to the current period as poor current pre-managed earnings could lead to a manager being dismissed. Payne and Robb (2000) found that when pre-managed earnings are below market expectation, managers will use income-increasing discretionary accruals to increase earnings toward analysts' forecasts. Gao and Shrieves (2002) showed the relationship between CEO compensation components and earnings management is conditional on proximity of pre-managed earnings to an earnings benchmark, the closer the level of pre-managed earnings to earnings benchmarks, the more likely that managers engage in earnings management. Peasnell, Pope and Young (2000b, 2005) found that firms with pre-managed earnings below zero or below last year's earnings are more likely to report positive discretionary accruals. Daniel, Denis and Naveen (2008) reported that managers have the incentive to manage earnings upwards to avoid dividend cuts when managers anticipate that pre-managed earnings would otherwise fall short of the expected dividend levels.

Techniques to meet benchmarks are not limited to discretionary accruals only. Dechow et al. (2000) found that working capital and positive special items, in addition to discretionary accruals are used as mechanisms to achieve small profits and to meet analysts' forecasts. Analysts' forecasts are also achieved through either managing sales upward or managing operating expense downward (Plummer & Mest 2001). Phillips et al. (2003) found that deferred tax expenses are associated with benchmark beating behaviour of reporting profits and earnings increases, whereas total accruals are associated with benchmark beating behaviour of meeting analysts' earnings forecasts. Using real earnings manipulations (accelerated sales recognition,

increasing production to reduce cost of goods sold), Roychowdhury (2006) documented that managers avoid reporting annual losses and negative changes in earnings. In a fundamental sense, however, as observed by Jones (1991), management discretions are made through accruals. More accruals are in place simply because the accounting system creates accruals to recognise revenues when they are earned and match expenses to those revenues, irrespective of whether cash has been received or paid. In addition, discretionary accruals are likely to be the prime measures for earnings management because the level of discretionary accruals is difficult to be monitored by outsiders (Gaver et al. 1995). Given the scope of this research, and based on prior literature, we rely on the discretionary accruals (DA) of Jones (1991) to estimate earnings manipulation. Nonetheless, we subject this estimation to alternate specifications and robust adjustments.

In this paper, we postulate that when pre-managed earnings are below benchmarks, managers will inflate income to report profits and earnings increase. In our setting, the pre-managed earnings is the condition of managerial discretion to adjust earnings from losses or earnings decreases to report *ex post* profits or earnings increases. We examine firms with negative pre-managed earnings (and pre-managed earning changes) and categorise them to have negative profits or earnings decreases prior to any earnings manipulation. Our two hypotheses (in alternative forms) are thus as follows:

> *H1: When pre-managed earnings are negative, firms are more likely to use discretionary accruals to report marginal profit.*
>
> *H2: When the current period pre-managed earning are below previous period reported earning, firms are more likely to use discretionary accruals to report positive change in earnings.*

Research Methodology

Earnings Distribution

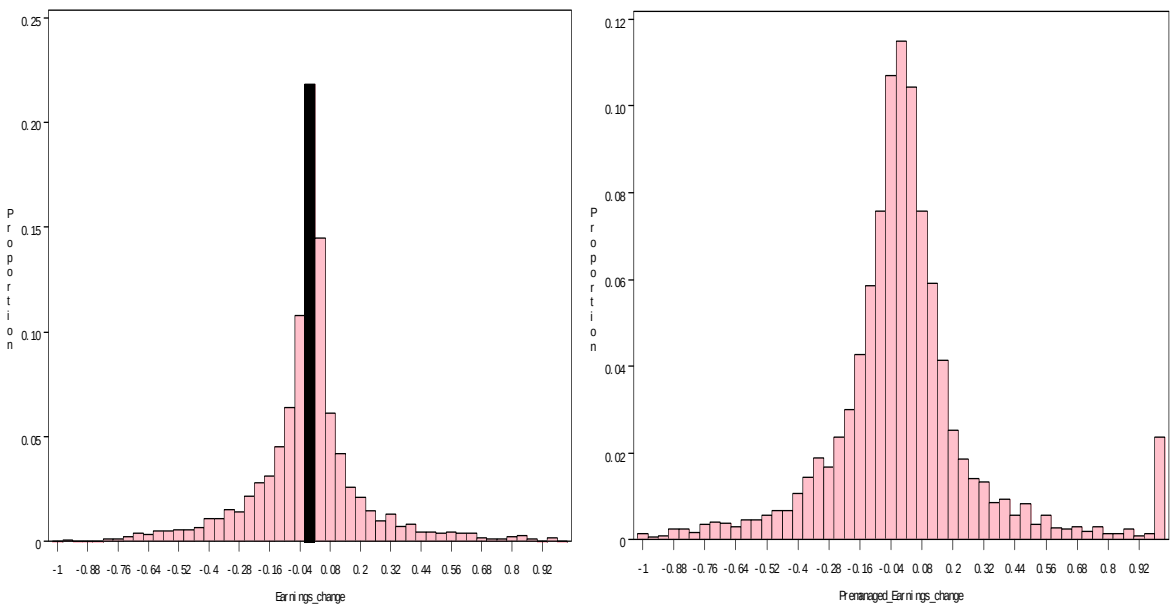
In a manner similar to Burgstahler and Dichev (1997), we construct histograms of the earnings and earnings changes. Earnings are measured as income before extraordinary items deflated by beginning total assets. The changes of earnings are measured as difference of income before extraordinary items between year *t* and year *t-1* deflated by beginning total assets. Our two benchmarks are reported profits and earnings increases. Silverman (1986) and Scott (1992) suggest that the interval width of a histogram should be positively related to the variability of the data and negatively related to the number of observations. To determine the interval widths, we performed both the calculations and the visual inspection, we calculate histograms interval width as $2(IQR)n^{-1/3}$, where *IQR* is the sample inter-quartile range and *n* is the number of observations. This returns an interval width of 0.04 for both earnings level and earnings change distributions. [4] Although we would prefer to have a finer width, we are constrained by our sample size which is smaller than those of Burgstahler and Dichev (1997), Holland and Ramsay (2003) and Coulton et

[4] Burgstahler and Dichev (1997) use interval widths of 0.005 for scaled earnings and 0.0025 for scaled changes in earnings. Holland and Ramsay (2003) use 0.01 for scaled net profit after tax and 0.005 for scaled changes in net profit after tax. Coulton et al. (2005) use 0.01 for both earnings levels and changes in earnings.

al. (2005). Following our empirical calculation and visual inspection, we chose 0.04 as an appropriate interval width for our sample size. This interval width is also consistent with Cheng and Warfield (2005) who measure earnings surprises that are equal to or greater than four cents.

Figure 2-Histograms of earnings and pre-managed earnings changes

Panel A-Earnings changes (ΔEit) Panel B-Pre-managed earnings changes (ΔPMEit)



We then formally test whether observed discontinuities are significant. Under the null hypothesis with smooth earnings distribution, the standardised difference of each interval with respect to distribution should be equal to zero (Burgstahler & Dichev 1997). If managers exercise positive discretionary accruals to report profits or earnings increase, we would expect to see the standardised difference to be significantly negative for the interval immediately below zero and significantly positive for the interval immediately above zero. The z-statistic used to test the null is the difference between the actual and expected number of observations in an interval divided by the estimated standard deviation of the difference.[5]

Discretionary Accruals

We use discretionary accruals as a proxy for earnings management. Peasnell et al. (2000a) evaluated different models in estimating discretionary accruals and suggested that the power to

[5] The Z-statistic is defined as: Z= $\frac{n - E(n)}{\sqrt{Var}}$ where n is actual number of observations in the interval; *E(n) is* expected number of observations in the interval, defined as the average of the number of observations in the intervals immediately adjacent to the interval; $\sqrt{Var}$ is the estimated standard deviation of the difference, calculate as: $\sqrt{Var} = \sqrt{N \cdot p_i(1 - p_i) + (1/4)N \cdot (p_{i-1} + p_{i+1}) \cdot (1 - p_{i-1} - p_{i+1})}$; Where N is the total number of observations and p_i is the probability that an observation will fall into interval i

detect earnings management seems to be higher for the cross-sectional Jones (1991) model. We include change in cash flows from operations as an additional explanatory variable into the Jones model based on evidence in McNichols and Wilson (1988) and Dechow (1994, 1995) indicating that change in cash flow from operations are negatively correlated with total accruals. The modified Jones model used in our analysis is:

$$TAC_{it} / TA_{it-1} = a_1(1/TA_{it-1}) + a_2(\Delta REV_{it} / TA_{it-1}) + a_3(PPE_{it} / TA_{it-1}) + \alpha_4 \Delta CF_{it} + \varepsilon_{it} \qquad (1)$$

where TAC_{it} is total accruals for firm i for year t scaled by total assets for year t-1; total accruals are calculated as the difference between net operating income and operating cash flows. TA_{it-1} is total assets for firm *i* at the beginning of year *t*. ΔREV_{it} is net sales for firm i for year t less net sales for firm *i* for year *t-1* scaled by total assets for year *t-1*. PPE_{it} is the gross property, plant and equipment for firm i for year t scaled by total assets for year *t-1*. ΔCF_{it} is operating cash flows for firm i for year t less operating cash flows for firm *i* in year *t-1* scaled by total assets for year t-1. $\alpha_1, \alpha_2, \alpha_3, \alpha_4$ denote industry year specific estimated coefficients. ε_{it} is the error term.

Researchers also argue that tests related to earnings management that do no control for a firm's earnings performance are misspecified. For example, Dechow et al. (1995) found that the measurement errors in estimation of discretionary accruals are negatively correlated with firm earnings performance. We employ Kasznik's (1999) matched-portfolio technique to adjust potential measurement error that is correlated with earnings performance. First, we obtain discretionary accruals, *i.e.* the residual from cross sectionally estimating equation (1) by GICS industry and by year. Then, we rank discretionary accruals into percentile groups by return on assets in period t (ROA_t), defined as operating income deflated by lagged total assets. We then compute the median discretionary accruals for each percentile and subtract it from each observation's discretionary accruals in that percentile (see equation 2). By standardising the residuals in this manner we remove the possible bias that firms having higher (lower) residuals are likely to manage earnings at a rate higher (lower) than the median performance firm. As such our measure of discreationary accrual is

$$Adj(DA_{it}) = DA_{it} - Median(DA)_{pt} \qquad (2)$$

Where DA_{it} is raw discretionary accruals for firm *i* for year *t* obtained as residual from equation (1), $Median(DA)_{pt}$ is median value of the discretionary accruals for a portfolio *p* at year *t*, and *p* is the percentile ranking of raw discretionary accruals based on firm's return on assets.

Pre-managed Earnings

The research design used in this study involves examining the link between discretionary accruals and whether pre-managed earnings are below or above earnings benchmarks. By definition, the sum of true pre-managed earnings and discretionary accruals is equal to reported earnings. Following Gore et al. (2007), the pre-managed earnings are measured as earnings in year *t* minus adjusted discretionary accruals and is used to capture the true earnings levels prior to managerial manipulation; the pre-managed changes in earnings are measured as the difference between earnings in year *t* and year *t-1* minus adjusted discretionary accruals and is used to capture the true earnings changes before earnings management.

$$PME_{it} = E_{it} - Adj(DA)_{it} \quad (3)$$

$$\Delta PME_{it} = \Delta E_{it} - Adj(DA)_{it} \quad (4)$$

Where PME_{it} is pre-managed earnings; ΔPME_{it} is pre-managed earnings change; E_{it} is reported earnings, measured as income before extraordinary items deflate by the beginning total assets; ΔE_{it} is reported earnings change, measured as the difference of income before extraordinary items between year *t* and year *t-1* deflated by the beginning total assets; $Adj(DA)_{it}$ is adjusted discretionary accruals obtained from equation (2); *i* and *t* denote firm and year, respectively.

Regression Model

In testing under what circumstances managers will inflate income to beat two earnings benchmarks, we predict when pre-managed earnings are below benchmarks, managers will inflate income to report profits and report earnings increase. We test whether firms with pre-managed earnings below benchmarks will use positive discretionary accruals to beat the benchmarks. Accordingly, our dependent variable is the adjusted discretionary variable ($Adj(DA_{it})$ from equation (2) above.

We partition our sample where pre-managed earnings (changes) are below and above zero. The changes in earnings and pre-managed earnings are standardised around 0. We then condition our analysis by having firms which have the reported earnings (changes) above zero. These firms are more likely to engage in income-increasing earnings management as their pre-managed earnings levels (changes) are below benchmarks but try to report *ex post* profits (earnings increases). Following Holland and Ramsay (2003) and Coulton et al. (2005), we also focus on small earnings intervals of [−0.04, 0] and [0, +0.04] immediately surrounding these benchmarks. Firms which are expected to make small losses (earnings decreases) are more likely than other firms to engage in earnings manipulation. Accordingly, we create several clusters of firms based on these benchmarks conditioned on changes in earnings and pre-managed earnings.

Our regression model to test earnings management behaviour takes the following form:

$$Adj(DA)_{it} = \alpha_0 + \beta_1 CLUSTER_N_{it} + \beta_2 SIZE_{it} + \beta_3 GROWTH_{it} + \beta_4 ROA_{it} + \beta_5 WC_{it} + \beta_6 LEV_{it} + \beta_j \Sigma IND_j + \epsilon_{it} \quad (5)$$

The variable of interest in this model is the indicator variable $CLUSTER_N_{it}$. The $CLUSTER_N_{it}$ takes four constrained form as follows:

$CLUSTER_1_{it}$ = 1 if ($PME_{it} < 0$ OR $\Delta PME_{it} < 0$), 0 otherwise;

$CLUSTER_2_{it}$ = 1 if ($PME_{it} < 0$, $E_{it} \geq 0$ OR $\Delta PME_{it} < 0$, $\Delta E_{it} \geq 0$), 0 otherwise;

$CLUSTER_3_{it}$ = 1 if ($-0.04 \leq PME_{it} < 0$ OR $-0.04 \leq \Delta PME_{it} < 0$), 0 otherwise;

$CLUSTER_4_{it}$ =1 if ($-0.04 \leq PME_{it} < 0$, $0 \leq E_{it} < 0.04$ or $-0.04 \leq \Delta PME_{it} < 0$, $0 \leq \Delta E_{it} < 0.04$), 0 otherwise.

According to our hypotheses, we should see a positive association between the use of discretionary accruals and the firms in each of these clusters. If managers use discretion to inflate income in order to beat benchmarks, conditioned on the pre-managed earnings, the coefficients on $CLUSTER_N_{it}$ are expected to be positive across all four clusters. The first cluster

(CLUSTER_1_{it}) is a partition of our sample consisting of firms that have either negative or decline of earnings on a pre-managed basis. CLUSTER_2_{it} is a subset of CLUSTER_1_{it} having firms reporting positive earnings or positive change in earnings. CLUSTER_3_{it} and CLUSTER_4_{it} are similar to previous clusters but belong to group of firms who have narrowly missed out on earnings performance in terms of their pre-managed earnings. We define these narrowly missing firms as 'just-miss' firms.

In our cross sectional regression, we employ a vector of control variables recognised from previous literature to be associated with discretionary accruals. We control for firm size ($SIZE_{it}$), measured as the logarithm of the total assets at year *t,* as smaller firms are documented to be associated with earnings management (Chan, Faff & Ramsay 2005; Holland & Jackson 2004; Sanchez-Ballesta & Garcia-Meca 2007; Sloan 1996). The growth opportunity *(*$GROWTH_{it}$), measured by the change of sales between year *t* and *t-1* divided by total assets at year *t.* As growth firms have relatively strong incentives to meet earnings benchmarks the market penalises growth firms for negative earnings surprise (Barth, Elliott & Finn 1999; Beaver, Kettler5 & Scholes 1970; Minton & Schrand, 1999; Myers & Skinner, 2006; Skinner & Sloan, 2002). Profitability *(*ROA_{it}), measured by net operating income divided by total assets for firm *i* at year *t,* is included because prior studies either found lower accounting profits provide motivation for firms to manipulate earnings to mitigate financial constraints (Ashari et al. 1994; White 1970;), or earnings management firms tend to exhibit a high profitability as it affect managers' job security and the compensation contract (Degeorge et al, Patell & Zueckhauser 1999; Fudenberg & Tirole 1995; Hayn 1995). We expect that firms with greater working capital level (WC_{it}), measured by the difference between current assets and current liabilities for firm *i* in year *t,* are more likely to manage earnings to move from below a benchmark to above the benchmark because short-term working capital accrual gives managers more flexibility in exercising discretions (Burgstahler & Dichev 1997). We control for a firm's proximity to debt covenant violation (LEV_{it}), measured by total debt to total assets for firm *i* in year *t,* and a positive sign is expected (Dechow et al. 2000; Press &Weintrop 1990; Watts & Zimmerman 1978). Finally, we control for industry effects. IND_{jt} equals 1 if firm *i* is from *jth* GICS industry (Energy, Material, Metals and Mining, Industries, Consumer Discretionary, Consumer Staples, Health Care, Information Technology, Telecommunication and Utilities) and 0 otherwise.

The data set used in our study is of panel structure. With panel data structure, the OLS assumption of independence in regression error term is generally violated by the presence of both cross-sectional and time-series dependence (Greene 2002). We use a two-way cluster-robust regression to correct both cross-sectional and serial correlations (Thompson 2006). The two-way cluster-robust procedure allows clustering along the two dimensions and generates the heteroscedasticity-robust standard errors of White (1980).

Data and Sample Selection

The starting point for the sample is the population of all ASX listed firms in the DataStream database including active file, suspended file and dead file with necessary annual accounting and market data from the period 1999 to 2006. The initial sample includes 3,914 firms with 31,312 observations. This study excludes all firms in the financial sector with GICS code (4010-4040) since their financial statements are subject to special accounting regulations. They include 45 banks, 194 equity investment instruments, 228 general financial, 5 life insurance, 44 nonequity invest instruments, 19 nonlife insurance, 276 real estates, altogether 811 firms and 6,488

observations. Regulated firms from the Utilities sector have not been eliminated as the number is relatively few in Australia. Also excluded are 1,832 firm observations whose industry codes are unclassified by DataStream. A further 16,910 firm observations are omitted since necessary data for accrual estimation is missing: this includes the loss of observations for 1999 as lagged variables of total assets and first differencing taken for the variables of revenue, account receivables, and operating cash flows are required in regressions. Firms involved in restructuring activities with 10 observations are excluded. The entire ASX covers very large companies from the Top 200 ASX index, also included are many very small listed companies. Thus, the top and the bottom 1 % observations by extreme values of total assets are trimmed, including 125 observations. These sampling criteria resulted in a sample with necessary data for 5,947 firm-year observations for accrual estimation.

Since the estimation of the cross-sectional accrual model requires at least ten firms per industry-year combination, industry groups with fewer than ten observations in a given sample year are combined if they have close??GICS codes. As Australian markets are dominated by gold and mining industries, the Metals & Mining sector is extracted from the Material sector to see whether this sector has an industry cluster effect on earnings management practices. Both Metals & Mining and Material sectors use the same code (GICS 1510). This procedure results in nine GICS industry groups, that is, Energy (1010), Material (1510), Metals & Mining (1510), Industrials (2010-2030), Consumer Discretionary (2510-2550), Consumer Staples (3010-3030), Health Care (3510-3520), Information Technology (4510-4530), and Telecommunication & Utilities (5010-5510). Each of the firm-year observations in the estimation sample is assigned into one of the nine combined industry groups according to the GICS code. These criteria result in a final sample of 4,746 firm-year observations (Table 1 Panel A). Panel B and C of Table 1 report the distribution of firms across industry and years in our sample.

Table 1
Sample description

Panel A-Sample construction

The sample comprises DataStream equity files including all active suspended and dead equity firms from year 2000 to year 2006

Criteria	Firm-year
Initial firm-years with accounting data:	35,226
Less: Financial firms	(7,299)
Industries are not classified	(2,061)
Missing data	(21,007)
Extreme data (trimmed at 5% and 95% levels)	(110)
Final sample	4,746

Panel B- Final Sample by Industry

GICS	Industry	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1010	Energy	299	6.31	299	6.31
1510	Material	339	7.13	638	13.44
1510	Metals & Mining	1454	30.64	2092	44.08
2010-2030	Industrials	263	5.56	2355	49.64
2510-2550	Consumer Discretionary	783	16.48	3138	66.12
3010-3030	Consumer Staples	391	8.24	3529	74.36
3510-3520	Health Care	477	10.07	4006	84.43
4510-4530	Information Technology	618	13.02	4624	97.45
5010-5510	Telecommunication & Utilities	122	2.56	4746	100.00

Panel C-Final Sample by Year

Year	Frequency	Percent	Cumulative Frequency	Cumulative Percent
2000	184	3.88	184	3.88
2001	265	5.56	449	9.44
2002	502	10.58	951	20.02
2003	442	9.32	1393	29.34
2004	959	20.20	2352	49.55
2005	1163	24.50	3515	74.05
2006	1231	25.95	4746	100.00

Panel D-Summary statistics

Variables	Mean	Median	S.D.	Min	25%	75%	Max
E	-0.1242	-0.0291	0.3020	-1.6713	-0.2517	0.0644	0.5340
ΔE	0.0396	0.0033	0.6166	-2.8276	-0.0806	0.0649	17.9975
PME	-0.1261	-0.0409	0.3189	-1.8191	-0.2693	0.0761	0.6650
ΔPME	0.0378	-0.0011	0.6169	-2.8641	-0.1096	0.1028	17.8976
DA	-0.0271	-0.0037	0.1320	-0.4024	-0.0828	0.0655	0.3369
Adj (DA)	0.0019	-0.0000	0.0867	-0.1897	-0.0563	0.0574	0.2141
SIZE	10.5250	10.1603	2.0809	5.8972	8.9939	11.8425	16.0523
GROWTH	0.7311	0.0854	5.5019	-1.0000	-0.0970	0.3262	168.1289
ROA	-0.0841	-0.0361	0.2814	-3.4855	-0.1908	0.0781	1.3880
WC	0.2370	0.1475	0.5487	-9.3901	0.0238	0.3532	10.6387
LEV	0.1683	0.0812	0.3089	0.0000	0.0000	0.2666	9.0425

Variable definitions:

E	=	Reported earnings level, measured as income before extraordinary items deflate by the beginning total assets
ΔE	=	Reported earnings change, measured as the difference of income before extraordinary items between year *t* and year *t-1* deflate by the beginning total assets
PME	=	Pre-managed earnings level, calculated as reported earnings minus adjusted discretionary accruals
ΔPME	=	Pre-managed earnings change, calculated as reported earnings change minus adjusted discretionary accruals
DA	=	Raw discretionary accruals, estimated from the cash flow Jones model
Adj (DA)	=	Adjusted discretionary accruals, estimated as raw discretionary accruals adjust for extreme earnings performance

SIZE	=	Firm size, measured by the logarithm of the total assets
GROWTH	=	Growth opportunity, measured by the change of sales between year *t* and *t-1* divided by the beginning total assets
ROA	=	Profitability, measured by net operating income divided by total assets
WC	=	Working capital, measured by the difference between current assets and current liabilities
LEV	=	Leverage, measured by total debt to total assets

Basic descriptive statistics (Table 2) show that mean (median) reported earnings (*E*) and earnings change (Δ*E*) are −0.1242 (−0.0291) and 0.0396 (0.0033), respectively. The mean (median) of pre-managed earnings (*PME*) and their changes (Δ*PME*) are −0.1261 (−0.0409). Mean of (median) raw discretionary accruals is −0.0271 (−0.0037).

Table 2
Frequency distribution of reported earnings and pre-managed earnings

Panel A-Reported earnings level and change

Intervals	E			ΔE		
	Obs, Freq. (%)	Obs – Exp.	z-stat	Obs, Freq. (%)	Obs – Exp.	z-stat
−0.20	0.038	0.003	0.89	0.027	0.001	0.18
−0.16	0.039	−0.006	−1.72	0.03	−0.006	−2.00
−0.12	0.051	0.005	1.31	0.045	−0.001	−0.14
−0.08	0.053	−0.001	−0.25	0.061	−0.014	−3.39
−0.04	0.057	−0.013	−2.89***	0.105	−0.032	−6.15***
0	0.086	−0.008	−1.61	0.213	0.093	13.60***
0.04	0.131	0.070	5.52***	0.135	0.001	0.08
0.08	0.112	0.019	3.53	0.056	−0.031	−7.06
0.12	0.055	−0.017	−4.07	0.039	−0.002	−0.43
0.16	0.032	−0.008	−2.48	0.025	−0.005	−1.74
0.20	0.024	0.002	0.75	0.021	0.002	0.58

Panel B-Pre-managed earnings level and change

Intervals	PME			ΔPME		
	Obs, Freq. (%)	Obs – Exp.	z-stat	Obs, Freq. (%)	Obs – Exp.	z-stat
−0.20	0.037	−0.002	−0.60	0.053	0.026	1.93
−0.16	0.043	0.003	0.85	0.039	−0.017	−1.33
−0.12	0.044	−0.007	−1.94	0.058	0.002	0.11
−0.08	0.058	0.005	1.24	0.074	−0.001	−0.06
−0.04	0.063	−0.008	−1.88	0.092	0.021	1.19
0	0.083	0.006	1.26	0.068	−0.019	−1.19
0.04	0.092	0.010	1.90	0.082	0.019	1.13
0.08	0.081	0.004	0.83	0.058	−0.021	−1.41
0.12	0.063	−0.002	−0.46	0.076	0.024	1.45
0.16	0.049	0.003	0.77	0.047	−0.008	−0.58
0.20	0.029	−0.006	−1.92	0.034	0.004	0.34

Notes:
1).Earnings (changes) are deflated total assets as of the beginning of the annual period. The expected frequency is computed as the mean of the frequency in the two adjacent intervals. For the sake of the brevity, only intervals with earnings (changes) scaled by total assets ranging from −0.2 to 0.2 are presented in the table. The intervals are of width 0.04 of total asset. The frequencies are expressed as percentage of the total sample.
2). *** marks the significance levels are at 1% or better for the test of the intervals immediately below or above benchmarks.

Results

Do Firms Beat Benchmarks?

Figure 1, Panel A is a histogram of reported earnings levels with an interval width of 0.04 and a range of -1 to +1. This histogram shows the appearance of a single-peaked, bell-shaped distribution with discontinuities surrounding the standardised zero earnings benchmark. According to our standardised distribution, the expected frequency for firms who are in the interval of [-0.04, 0] is the average of the two adjacent intervals and is 0.70%. However, the observed frequency of reported earnings, E, is 0.57% for firms who are in this interval. This difference in observed frequency being less than the expected frequency by 0.13% ("obs-exp" column) is borne out by our Z-test statistic of -2.89 which is significant at one-percent level.

The firms reporting earnings between the interval of [-0.04, 0] are just-miss firms and their frequency under a normal distribution should not differ significantly for the rest of the distribution. This discontinuity in distribution suggests that some firms in this group may have boosted their earnings to go over the zero-benchmark to report positive earnings. Turning our attention to the group of firms which lie just above the zero-benchmark, we find their observed frequency is more than the expected frequency by 0.07% (0.131% versus 0.061%) and significantly so through our z-test statistic of 5.52 at one-percent level. If managers resort to earnings manipulation to report small profits, earnings discontinuity should be observed at the interval [0, +0.04], as is the case. The number of firms in the earnings interval of [0, +0.04] being in excess of the expected frequency bolsters the suggestion that there may be manipulation of earnings surrounding the zero-benchmark.

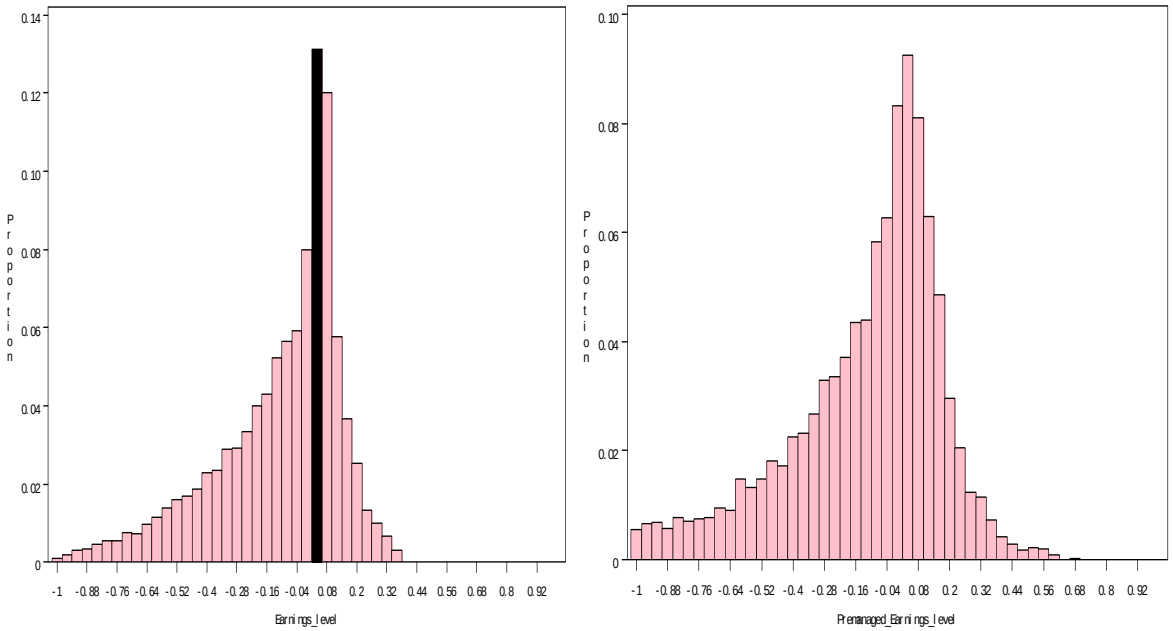
This discontinuity is also apparent when we consider the change in reported earnings (ΔE). The observed frequency of firms reporting just below the standardised earning of no-change benchmark, in the interval [-0.04, 0], is below the expected frequency by 0.032%. This difference is also highly significant through the z-test statistic of -6.15. Further evidence of possible earnings manipulation can be seen by observing the frequency difference for the group of firms at zero-change earnings benchmark. If the purpose of earnings management is to sustain last year's earning, then the discontinuity would also occur just at the zero interval when the change in earnings is considered as a benchmark. The observed frequency of firms reporting zero-change in earnings is significantly higher (z-stat=13.60)) than the expected frequency of 0.118%.

Next we generate a histogram for pre-managed earnings which are purged of the effect of discretionary accruals. Figure 1 Panel B displays the distribution of pre-managed earning levels that appears to be relatively smooth around zero. The smoothness is confirmed through the Z-statistics of standardised difference of frequencies immediately below and above zero-PME intervals and found to be insignificant (-1.88 and 1.90 respectively). Given that our adjusted discretionary accruals are a proxy of earnings management, the removal of adjusted discretionary accruals confirms the evidence of earnings manipulation. That is, in the absence of a discretionary component of accruals, the earnings of firms revert to their expected distribution. A similar result of no discontinuity is observed when we consider the distribution of change in pre-managed earnings. Our result from the distribution of pre-managed earnings, in levels and in

changes, is consistent with the prediction that the removal of adjusted discretionary accruals results in the disappearance of the discontinuity[6].

Figure 1
Distributions of earnings and pre-managed earnings

Panel A-Earnings levels (Eit) Panel B-Pre-managed eanings level (PMEit)



Do Firms Shift Earnings When Pre-managed Earnings are Below (or above) Benchmarks?

Table 3 shows the levels and changes of earnings surrounding our benchmarks, conditioned on pre-managed earnings. Panel A reports proportions of observations when the sample is divided according to reported earnings, E_{it}, being above or below zero, conditional on the pre-managed earnings being above or below zero. The overall proportion of firms with underlying earnings being less than zero is 57.71% (N=2739). However, when we portioned them according to actual reported earnings we found that 8.11% (N=385) have reported positive profits. In order to examine the possibility that this shift in reported earnings is due to earnings management, we check the differences in proportions for the overall group of firms that reported positive earnings against the proportion that has the PME_{it} >0. The portion of observations with the PME_{it} being more than zero is 42.29% (N=2007). Under the assumption that there is no attempt to manage earnings to report an ex-post profit, we should expect the frequency of our sample that reported profits, $E_{it} \geq 0$, to be close to 42.29%. However, we find that the frequency of reported profits is

[6] Holland and Ramsay (2003) use interval width of 0.01 in the range -0.25 to +0.24, and their test statistics are -2.83 for the interval immediately below zero and 3.85 for the interval immediately above zero. This result is also consistent with Coulton et al. (2005) who use 0.01 interval width for in a range of -0.24 to +0.24.

45.36% (N=2153). Following Kanji (1993), we apply the z-test for correlated change in the frequency before and after a given intervention and find the two frequencies are statistically different (z-statistic=5.87, p-value=0.001). This evidence suggests that discretionary accruals have the effect of significantly increasing the frequency of positive earnings levels.

Discretionary accruals also significantly increase the frequency of firms reporting small profits. Table 3 Panel A also shows frequencies of firms within small intervals of earnings, [−0.04, 0] and [0, +0.04], conditioned on similar intervals of pre-managed earnings. The frequency of firms reporting small earnings profits while their underlying pre-managed earnings is 'just-miss' is 11.82% (N=561). However, the overall proportion of firms with pre-managed earnings being positive is only 8.83% (N=419). This is a difference of 2.99 per cent of total sample with 142 observations and statistically different from zero using the Kanji z-test with a z value of 3.81. This evidence suggests that for some just-miss firms, discretionary accruals were used to report a just-above profit. We also find that within this subsample, 2.44 per cent (N=116) shift from pre-managed small earnings losses ($-0.04 \leq PME_{it} < 0$) to report small earnings profits ($0 \leq E_{it} < +0.04$) with significance level being less than one per cent (not reported in the table)[7].

Table 3, Panel B reports the impact of discretionary accruals on changes in reported earnings conditioned by the changes in pre-managed earnings. In our sample, the overall frequency of firms reporting increases in earnings is 52.19% (N=2477). At the same time, the proportion of firms reporting earnings increase while the pre-managed earnings change is also positive is 49.68% (N=2358). This difference in proportion is statistically different with a z-test statistic of 3.81. Moreover, 11.61 per cent (N=551) shift from a negative pre-managed earnings change ($\Delta PME_{it} < 0$) to report positive earnings change ($\Delta E_{it} \geq 0$). This finding is consistent with the argument that managers inflate earnings through discretionary accruals to transform previous year's lower earnings to report earnings that are higher than or at least equal to previous year's level.

In the small intervals of [−0.04, 0] and [0, +0.04], discretionary accruals also significantly increase the frequency of firms reporting small positive earnings change. Panel B Table 3 shows the frequency of firms reporting earnings change surrounding the zero-benchmark increases from 11.23 per cent (N=533) of the sub-sample when pre-managed earnings change is also positive, to 13.49 per cent when the overall group of just-above firms in the whole sample is considered (N=640). This is a shift of 2.26 per cent (N=123) and statistically significant at below one percent level with z-stat of 2.68[8]. Further, 3.88 per cent (N=184) shift from small pre-managed earnings decrease ($-0.04 \leq \Delta PME_{it} < 0$) to report small earnings increase ($0 \leq \Delta E_{it} < 0.04$), with the shift in proportion being significant (z-statistic= 2.68, p-value=0.01). Taken all. together, the results in Table 3 provides evidence that some firms use discretionary accruals to transform earnings in their levels and changes to report positive ex-post profits and earnings increases, shift small losses and earnings decreases into a zero or above profit and a small earnings increases while the underlying pre-managed earnings levels and changes may not be positive.

[7] Burgastahler and Dichev (1997) reported that 30−40% of U.S firms exercise discretion to report profits when pre-managed earnings are slightly negative. Comparatively, our results suggest a lower frequency of earnings management in Australia among the firms confronted with reporting earnings losses.

[8] Burgastahler and Dichev (1997) reported that in the U.S 8 to 12% of firms with small pre-managed earnings decreases exercise discretion to report earnings increase. Our result of 2.26 per cent is lower than that of Burgastahler and Dichev.

Table 3
Frequencies of observations shifting from pre-managed earnings (changes) below benchmarks to above benchmarks

Panel A-Pre-managed earnings level

	Eit < 0	Eit ≥ 0	Total	z-stat[d]
Firm-years with	2354	385	2739	
PMEit < 0	*49.60%*	*8.11%*	*57.71%*	
Firm-years with	239	1768	2007	5.87
PMEit ≥ 0	*5.04%*	*37.25%*	*42.29%*	
Total	2593	2153	4746	
	54.64%	45.36%	100%	
	-0.04≤Eit<0	0≤Eit<0.04		
Firm-years with	60	116	361[a]	
-0.04≤PMEit<0	*1.26%*	*2.44%*	*7.61%*	
Firm-years with	57	119	419[b]	4.49
0≤PMEit<0.04	*1.20%*	*2.51%*	*8.83%*	
Total	270[c]	621[d]	4746	
	5.68%	*13.08%*	*100%*	

Panel B-Pre-managed earnings change

	ΔEit<0	ΔEit≥0	Total	z-stat
Firm-years with	1837	551	2388	
ΔPMEit <0	*38.71%*	*11.61%*	*50.32%*	
Firm-years with	432	1926	2358	
ΔPMEit ≥0	*9.10%*	*40.58%*	*49.68%*	3.81
Total	2269	2477	4746	
	47.81%	*52.19%*	100%	
	-0.04≤ΔEit <0	0≤ΔEit<0.04		
Firm-years with	147	184	527[a]	
-0.04≤ΔPMEit <0	*3.10%*	*3.88%*	*11.10%*	
Firm-years with	136	202	533[b]	
0≤ΔPMEit<0.04	*2.87%*	*4.26%*	*11.23%*	2.68
Total	498[c]	640[d]	4746	
	10.49%	*13.49%*	*100%*	

a. the total number of observations of which pre-managed earnings (change) belong to the interval [−0.04, 0];
b. the total number of observations of which pre-managed earnings (change) belong to the interval [0, 0.04];
c. the total number of observations of which reported earnings (change) belong to the interval [−0.04, 0]; d. the total number of observations of which reported earnings (change) belong to the interval [0, 0.04]
d.. The Z statistics are computed from Kanji (1993) for correlated proportions and their shifts .

$$Z = \frac{(b - c) / N}{\sqrt{\dfrac{(b + c) - (b - c)^2 / N}{N(N - 1)}}}$$

Z = Z score test for the significant change in the correlated frequency before and after a given intervention
b = the number of observations shifts from pre-managed earnings losses to the reported earnings profits
c = the number of observations shifts from pre-managed earnings profits to the reported earnings losses
N = the total number of observations

e. Significance levels are two-tailed against the standardized normal distribution.

Do Firms have Higher Value of Discretionary Accruals when Pre-managed Earnings are Below Benchmarks?

We now turn our attention to the degrees of earnings management when the pre-managed earnings are below benchmarks. Our focus in this section is to see if the usage of discretionary accruals is limited only to firms who report 'small-profits'. Amongst all firms, firms most likely to manage earnings are likely to be those which are just-miss firms on the pre-managed earnings basis and may use the earnings manipulation methods to push the reported earnings above the benchmarks.

Table 4 presents the frequencies of adjusted discretionary accruals conditioned on pre-managed earnings. Panel A shows that, of all the firms which have positive discretionary accruals, roughly two thirds of firms (62.91%, N=1723) have underlying losses on a pre-managed basis ($PME_{i\ t} < 0$). If discretionary accruals (positive and negative) are to be randomly distributed amongst all firms, we would expect to see their distribution evenly split between firms which are making losses and profits on a pre-managed basis. This evidence suggests those firms with a pre-managed loss have a lot more usage of the positive discretionary accruals and thereby inflating earnings than those making pre-managed profits. A similar comparison for firms in small intervals surrounding the zero-benchmark ($-0.04 \leq PME_{it} < 0$) shows that 58.72 per cent (N=212) of pre-managed small-loss making firms have positive discretionary accruals while the corresponding frequency for small-profit making firms ($0 \leq PME_{it} < +0.04$) is 45.34 per cent. In Panel B, when we condition the discretionary accruals with corresponding changes in pre-managed earnings 69.14 per cent (N=1651) of firms with negative changes in pre-managed earnings have positive discretionary accruals as compared to only 30.58 per cent (N=721) when the underlying pre-managed earning changes are positive ($\Delta PME_{it} \geq 0$). In the smaller intervals, there are 57.31 per cent of firms (N=302) with pre-managed earnings slightly below last year's earnings ($-0.04 \leq \Delta PME_{it} < 0$) that have positive discretionary accruals, whereas 33.21 per cent of firms (N=177) with pre-managed earnings slightly above last year's earnings ($0 \leq \Delta PME_{it} < 0.04$) show positive discretionary accruals. This evidence in table 4 suggest that firms are likely to have much more usage of positive discretionary accruals when faced with negative changes in underlying earnigns, possibly to manipulate and report earnings higher than last year's earnings. This pattern is especially prominent for those firms which can be characterised as just-miss firms.

Table 4
Frequencies of positive adjusted discretionary accruals when pre-managed earnings (changes) below benchmarks

Panel A-Pre-managed earnings level

	$Adj(DA)_{it} < 0$	$Adj(DA)_{it} \geq 0$	Total
Firm-years with	1016	1723	2739
$PME_{it} < 0$	*37.09%*	*62.91%*	*100%*
Firm-years with	1358	649	2007
$PME_{it} \geq 0$	*67.66%*	*32.34%*	*100%*
Total	2374	2372	4746
Firm-years with	113	212	361
-0.04≤PMEit<0	*31.309%*	*58.72%*	*100%*
Firm-years with	137	190	419
0≤PMEit<0.04	*32.69%*	*45.34%*	*100%*
Total	250	402	780

Panel B-Pre-managed earnings change

	$Adj(DA)_{it} < 0$	$Adj(DA)_{it} \geq 0$	Total
Firm-years with	737	1651	2388
$\Delta PME_{it} < 0$	*30.86%*	*69.14%*	*100%*
Firm-years with	1637	721	2358
$\Delta PME_{it} \geq 0$	*69.42%*	*30.58%*	*100%*
Total	2374	2372	4746
Firm-years with	172	302	527
-0.04≤ΔPMEit <0	*32.64%*	*57.31%*	*100%*
Firm-years with	279	177	533
0≤ΔPMEit<0.04	*52.34%*	*33.21%*	*100%*
Total	451	479	1060

Note: This table evaluates whether firms with pre-managed earnings (changes) below benchmarks more likely to exercise positive discretionary accruals to manage earnings upwards. PME is pre-managed earnings level, calculated as reported earnings minus adjusted discretionary accruals; ΔPME is pre-managed earnings change, calculated as reported earnings change minus adjusted discretionary accruals; Adj (DA) is adjusted discretionary accruals, estimated from Jones (1991) version cash flows model adjust for extreme earnings performance

Table 5 reports the mean and median levels of discretionary accruals conditioned on pre-managed earnings. Panel A reports that firms with pre-managed earnings below zero have significantly positive mean and median discretionary accruals of 0.0273 and 0.0311 resepectively while firms with pre-managed earnings of above zero exhibit significantly negative mean and median discretionary accruals of −0.0329 and −0.0292. Two sample t-test for the mean show that discretionary accruals are significantly different between the two sub samples of pre-managed earnings partitioned at zero. This result supports our earlier result in table 4 that firms with negative pre-managed earnings have higher usage of positive discretionary accruals. Within the small interval of $[-0.04 \leq PME_{it} < 0]$ discretionary accruals of firms with pre-managed earnings loss there is significantly positive mean and median, 0.0154 and 0.0260, respectively. Further, the mean and median discretionary accruals of firms within the interval of $[0 \leq PME_{it} < 0.04]$ are statistically not different from zero. For the firms whose pre-managed earnings are already positive, though small, are already meeting benchmarks and hence do not have incentive to manipulate earnings.

Panel B of Table 5 shows a similar pattern of $Adj(DA)_{it}$ to that of Panel A when pre-managed earnings change is considered. Firms with negative pre-managed earnings change have higher positive discretionary accruals than those with positive pre-managed earnings change. The

mean (median) discretionary accruals for firms with worsening pre-managed earnings ($\Delta PME_{it} < 0$) is 0.0336 (0.0349) and significantly positive. However, when we consider firms with improving pre-managed earnings ($\Delta PME_{it} > 0$), the mean (median) discretionary accruals is significantly negative −0.0303 (−0.0334). Within the small interval of pre-managed earnings change ($-0.04 \leq \Delta PME_{it} < 0$), the mean (median) discretionary accruals of firms within is also positive 0.0099 (0.0129) and significantly different from zero. Conversely the mean (median) discretionary accruals of firms within the small interval of positive change in pre-managed earnings ($0 \leq \Delta PME_{it} < 0.04$) is significantly negative at −0.0073 (−0.0090). Two sample t- tests show that discretionary accruals are significantly different between two sub samples of pre-managed earnings that are below and above last year's earnings.

Table 5

Adjusted discretionary accruals comparing firms with pre-managed earnings are below to above benchmarks

Panel A-Pre-managed earnings level

	PME < 0			PME ≥ 0			Test for difference	
	N	Mean	Median	N	Mean	Median	t-test	p-value
Adj(DA)	2739	0.0273***	0.0311***	2007	−0.0329***	−0.0292***	25.96	<.0001

	−0.04 ≤ PME < 0			0 ≤ PME < 0.04			Test for difference	
	N	Mean	Median	N	Mean	Median	t-test	p-value
Adj(DA)	361	0.0154***	0.0260***	419	0.0010	0.0073	2.98	0.0029

Panel B-Pre-managed earnings change

	ΔPME < 0			ΔPME ≥ 0			Test for difference	
	N	Mean	Median	N	Mean	Median	t-test	p-value
Adj(DA)	2388	0.0336***	0.0349***	2358	−0.0303***	−0.0334***	27.36	<.0001

	−0.04 ≤ ΔPME < 0			0 ≤ ΔPME < 0.04			Test for difference	
	N	Mean	Median	N	Mean	Median	t-test	p-value
Adj(DA)	527	0.0099***	0.0129***	533	−0.0073***	−0.0090***	4.84	<.0001

Note:

1).This table evaluates whether discretionary accruals are different between pre-managed earnings loss (decline) firms and pre-managed earnings profit (increase) firms. We compare two intervals: (1) pre-managed earnings loss (decline) versus pre-managed earnings profit (increase); and (2) small pre-managed earnings loss (decline) versus small pre-managed earnings profit (increase). PME is pre-managed earnings level, calculated as reported earnings minus adjusted discretionary accruals; ΔPME is pre-managed earnings change, calculated as reported earnings change minus adjusted discretionary accruals; Adj (DA) is adjusted discretionary accruals, estimated from Jones (1991) version cash flows model adjust for extreme earnings performance. 2). T-statistics are based on t-test for the difference in means across samples and p-values are two-tailed.

These results support our prediction that firms manage earnings upward when the firm's pre-managed earnings performance under-shoots the benchmark. Our results are consistent with Peasnell et al. (2000a, 2005) who find evidence of 'cookie-jar' accounting and that earnings management to beat benchmarks is associated with board composition of non-executive and outside board members. Our evidence supports the 'cookie jar accounting' theory of managers decreasing earnings when pre-managed earnings are well above benchmarks in order to save some income to beat benchmarks in the future. This is also consistent with Degeorge et al. (1999) who documented that managers systematically manipulate reported earnings downwards when pre-managed earnings exceed threshold earnings by a substantial amount.

Discretionary Accruals and Pre-managed Earnings Benchmarks

In this section, we test whether discretionary accruals associated with pre-managed earnings fall short of particular benchmarks. We use equation (5) to test for benchmarks after controlling for firm size, growth rate, profitability, working capital, leverage, and industry effects discussed earlier.[9] Since our focus is on the association between benchmarks and discretionary accruals, we do not discuss estimates of controlling factors but are note them in tables.

Regression models 1 and 2 of Table 6 Panel A present regression results of $Adj(DA_{it})$ of firms with underlying losses. The positive and significant coefficient estimate on *CLUSTER_1* in model 1 is consistent with the hypothesis that managers make use of positive discretionary accruals when pre-managed earnings are negative. In model 2, we restrict our sample to firms reporting *ex-post* profits ($E_{it} \geq 0$) while the underlying earnings are negative. The coefficient on *CLUSTER_2* is significantly positive, indicating that for these profit reporting firms, managers tend to use positive discretionary accruals when pre-managed earnings are negative. It should be also noted that the coefficient estimate on *CLUSTER_2* is stronger than *CLUSTER_1* (0.0819 versus 0.1126). This larger estimate on CLUSTER_2 provides some evidence that the earnings management activity is likely to be concentrated in firms that have reported positive profits among the loss-making firms. Model 3 and 4 are regressions based on small intervals surrounding zero. Both coefficients on *CLUSTER_3* and *CLUSTER_4* are significant positive, which is consistent with the view that when firms have pre-managed earnings slightly below zero, managers use positive discretionary accruals to inflate reported earnings to report small profits. Again, the larger coefficient estimate on *CLUSTER_4* (0.0403 versus 0.0268) signifies our conjecture that small-loss firms have stronger incentive to use discretionary accruals to push into positive profit territory. Expectedly the predictive ability of our model, signified by R^2 estimates of regressions, increases as testing intervals move from bigger to smaller and more specific regions surrounding benchmark. Nevertheless these results validate our hypotheses that firms use discretionary accruals to beat benchamarks.

[9] For the sake of brevity, the control variables results are not discussed.

Table 6
Two-way cluster-robust regression of adjusted discretionary accruals on pre-managed earnings are below benchmarks and control variables

Panel A-Pre-managed earnings level

Independent Variables	Expected sign	Model 1	Model 2	Model 3	Model 4
Intercept	?	-0.0450	-0.0381	-0.0052	-0.0295
		(-3.45)***	(-2.44)**	(-0.35)	(-3.03)***
CLUSTER_1 (PMEit<0)	+	0.0819			
		(25.87)***			
CLUSTER_2 (PMEit< 0, Eit≥ 0)	+		0.1126		
			(29.39)***		
CLUSTER_3 (−0.04≤PMEit<0)	+			0.0268	
				(8.41)***	
CLUSTER_4 (−0.04≤ PMEit<0, 0≤ Eit<0.04)	+				0.0403
					(19.29)***
SIZE	−	-0.0012	-0.0019	-0.0015	0.0015
		(-1.61)	(-2.28)**	(-1.50)	(2.32)**
GROWTH	+	0.0000	0.0000	-0.0003	0.0002
		(0.84)	(0.84)	(-1.45)	(0.18)
ROA	?	0.0856	0.0917	0.4518	0.0459
		(14.10)***	(8.82)***	(25.67)***	(3.03)***
WC	+	0.0123	0.0149	0.0272	0.0140
		(3.46)***	(2.37)**	(4.38)***	(2.18)**
LEV	?	0.0159	0.0425	0.0007	-0.0021
		(3.66)***	(4.48)***	(0.07)	(-0.29)
INDUSTRY EFFECTS		Yes	Yes	Yes	Yes
N		2739	385	361	116
Adj. R^2		0.2005	0.3521	0.5610	0.6437

Adj(DA) = Adjusted discretionary accruals scaled by total asset at year t-1, estimated from equation (2)

CLUSTER = An indicator variable equals to 1 if pre-managed earnings (change) is less than zero and zero otherwise. We test four regions for each of earnings benchmarks, where 1) PME_{it} (ΔPME_{it}) < 0; 2) PME_{it} (ΔPME_{it}) < 0; E_{it} (ΔE_{it}) ≥ 0; 3) −0.04≤ PME_{it} (ΔPME_{it}) < 0; and 4) −0.04≤ PME_{it} (ΔPME_{it}) < 0; 0 ≤ E_{it}< 0.04. Pre-managed earnings level (PME) are defined as reported earnings (E) minus adjusted discretionary accruals; pre-managed earnings change (ΔPME), calculated as reported earnings change (ΔE) minus adjusted discretionary accruals (see Equation 3,4)

SIZE = Firm size for firm *i* for year *t*, measured by the logarithm of the total assets at year *t*;

GROWT = Growth opportunity for firm *i* for year *t*, measured by the change of sales between year *t* and *t-1* divided by total assets at year *t*

ROA = Profitability, measured by net operating income divided by total assets for firm *i* at year *t*

WC = Working capital, measured by the difference between current assets and current liabilities for firm *i* in year *t*

LEV = Leverage, measured by total debt to total assets for firm *i* in year *t*

$\sum_j IND_j$ = 1 if firm *i* is from industry *j*, based on GICS industrial codes and 0 otherwise

2). P-values are given in parentheses below the coefficient, one-tailed tests when we have explicit predictions and two-tailed otherwise.
3). the estimated coefficients and *t* statistics are two-way cluster-robust adjusted with White (1980) method.

Table 7 shows regression tests of $Adj(DA_{it})$ of firms which have pre-managed earnings below last year's earnings. We find positive and significant coefficient estimate on *CLUSTER_1*. In model 2, we restrict our sample to reported earnings above last year's earnings ($\Delta E_{it} \geq 0$) and find that the coefficient on *CLUSTER_2* is not only significantly positive but also higher than the model 1 estimate. This means managers tend to use positive discretionary accruals to report income increase to give appearance of sustaining previous year's earnings even when pre-managed earnings fall short of the prior year's level. In Model 3 and 4, we consider the intervals

[-0.04, 0] and [0, +0.04] surrounding zero. Both the coefficients on *CLUSTER_3* and *CLUSTER_4* are significantly positive, which is consistent with the hypothesis that when pre-managed earnings are slightly below last year's earnings, managers use income increasing discretionary accruals to inflate earnings to report small but positive earnings increase. From Model 1 to Model 4, we find a consistent and positive association between discretionary accruals when pre-managed earnings are below targets. This suggests that managers shift earnings from losses or earnings decreases on a pre-managed basis to report *ex post* profits or earnings increases.

Table 7
Pre-managed earnings change

Independent Variables	Expected sign	Model 1	Model 2	Model 3	Model 4
Intercept	?	0.0071	0.0697	-0.0105	-0.0056
		(0.55)	(3.66)***	(-0.58)	(-0.50)
CLUSTER_1 (ΔPMEit <0)	+	0.0612			
		(23.20)***			
CLUSTER_2 (ΔPMEit < 0, ΔEit ≥ 0)	+		0.1004		
			(26.06)***		
CLUSTER_3 (−0.04≤ΔPMEit<0)	+			0.0189	
				(5.36)***	
CLUSTER_4 (−0.04≤ ΔPMEit <0, 0≤ ΔEit <0.04)	+				0.0354
					(21.09)***
SIZE	−	-0.0052	-0.0074	-0.0036	-0.0010
		(-7.05)***	(-8.13)***	(-3.54)***	(-2.05)**
GROWTH	+	0.0000	0.0000	0.0002	0.0002
		(1.04)	(1.36)	(2.82)**	(0.51)
ROA	?	0.0402	0.0002	0.0877	0.0243
		(7.03)***	(0.03)	(7.9)***	(2.68)***
WC	+	0.0039	0.0131	-0.0029	-0.0130
		(1.09)	(2.41)**	(-0.44)	(-2.42)**
LEV	?	0.0167	0.0408	0.0023	-0.0008
		(3.78)***	(4.86)***	(0.20)	(-0.13)
INDUSTRY EFFECTS		Yes	Yes	Yes	Yes
N		2388	551	527	184
Adj. R^2		0.1749	0.2997	0.1078	0.5845

Notes:
1). Variable definitions:

Adj(DA)	=	Adjusted discretionary accruals scaled by total asset at year t-1, estimated from equation (2)
CLUSTER	=	An indicator variable equals to 1 if pre-managed earnings (change) is less than zero and zero otherwise. We test four regions for each of earnings benchmarks, where 1) PME_{it} (ΔPME_{it}) < 0; 2) PME_{it} (ΔPME_{it}) < 0; E_{it} (ΔE_{it}) ≥ 0; 3) −0.04≤ PME_{it} (ΔPME_{it}) < 0; and 4) −0.04≤ PME_{it} (ΔPME_{it}) < 0; 0 ≤ E_{it}< 0.04. Pre-managed earnings level (PME) are defined as reported earnings (E) minus adjusted discretionary accruals; pre-managed earnings change (ΔPME), calculated as reported earnings change (ΔE) minus adjusted discretionary accruals (see Equation 3,4)
SIZE	=	Firm size for firm *i* for year *t*, measured by the logarithm of the total assets at year *t*;
GROWT	=	Growth opportunity for firm *i* for year *t*, measured by the change of sales between year *t* and *t-1* divided by total assets at year *t*
ROA	=	Profitability, measured by net operating income divided by total assets for firm *i* at year *t*
WC	=	Working capital, measured by the difference between current assets and current liabilities for firm *i* in year *t*
LEV	=	Leverage, measured by total debt to total assets for firm *i* in year *t*
$\sum_j IND_j$	=	1 if firm *i* is from industry *j*, based on GICS industrial codes and 0 otherwise

2). P-values are given in parentheses below the coefficient, one-tailed tests when we have explicit predictions and two-tailed otherwise.
3). the estimated coefficients and *t* statistics are two-way cluster-robust adjusted with White (1980) method.

Further Tests

We perform a variety of additional tests to assess the robustness of our findings to measurement errors associated with discretionary accruals.

The finding of the disappearance of the discontinuity around zero in the histogram analysis could be argued as a statistical artefact because the construction of the pre-managed earnings basically removes the variation from the Jones model. To test this, following the method of Gore et al (2007) we generate a randomly determined 'pseudo discretionary accruals' for each firm-year observation. The sample of pseudo discretionary accruals has a normal distribution with mean and standard deviation set equal to the sample distribution of $Adj(DA_{it})$. We then construct the pre-managed earnings as reported earnings minus the pseudo discretionary accruals (rather than removing the $Adj(DA_{it})$) and recreate the histogram. The histogram shows that simulated distribution of pre-managed earnings is fairly smooth around zero. Moreover, Z-statistics in the intervals immediately below and above zero are −0.62 and −1.10 (not reported), which are insignificantly different from the expected frequencies. We also construct the pre-managed earnings change as reported earnings changes minus the 'pseudo discretionary accruals change'. We obtain similar results in that the simulated distribution of pre-managed earnings change is smooth. Therefore, without invoking Jones model, the simulation of discretionary accruals through pseudo accruals illustrates how accrual manipulation contributes to a discontinuity in the distribution of reported earnings and earnings changes.

Second, the construction of pre-managed earnings is to essentially 'back out' or deduct estimates of discretionary accruals from reported earnings. Error in estimating discretionary accruals can lead to possible error in the estimation of pre-managed earnings. This in turn could induce spurious association between accounting discretions and pre-managed earnings (Lim & Lustgarten 2002). Following Barua et al. (2006), we use non-discretionary accruals to replace discretionary accruals when pre-managed earnings are below or above targets to test for accounting discretion. The intuition behind this procedure is that non-discretionary accruals are not supposed to involve earnings management. However, if results are similar to that of discretionary accruals, then the findings are likely to be a consequence of the backing-out error. We redefine pre-managed earnings as net income before extraordinary items minus non-discretionary accruals ($PME_{it}=E_{it}-NDA_{it}$) and repeat all the tests. The regression results show that $CLUSTER_N_{it}$ are significantly *negative* in all the four models suggesting that our results are not simply a consequence of the backing-out problem.

Finally, we use two smaller interval widths of 0.01 and 0.005 to assess whether the discontinuity presented in the primary analysis is an artefact of a pre-determined interval. If the interval width is too large or small, then the frequencies may not be sensitive to shifts in proportions in them. Our tests from the adjustments of intervals are qualitatively similar to earlier results in Tables 2 and 3, although with the finer interval we lose the power of our tests.

We also use operating cash flow as an instrumental variable to surrogate for pre-managed earnings as operating cash flow is not related to discretionary accruals (Peasnell et al. 2005). For the profit benchmark, the results remain qualitatively unchanged to those reported in the main text.

Conclusion

This study exploits the distributional properties of *ex post* earnings and links such properties with *ex ante* pre-managed earnings to identify behaviour that is consistent with earnings management practices to beat benchmarks. Using a sample period of 2000 to 2006, we find significant discontinuities in the distribution of reported earnings. These discontinuities disappear after the removal of discretionary components of the earnings in its pre-managed earnings form. This evidence is broadly supportive of prior research in Australian context.

We attempt to find the causality of spikes in reported earnings by examining whether managers attempt to influence earnings in trying to meet implicit two earnings benchmarks: avoiding losses (zero profit) and positive change in earnings. We find that when pre-managed earnings are below zero or prior year's earnings, firms are more likely to exercise positive discretionary accruals to inflate earnings to beat both of these earnings benchmarks. We document this through establishing links between frequencies of firms in various subsets of our sample to these benchmarks and through our cluster-robust regressions.Our approach and measure of pre managed earnings sheds useful insight into the *ex ante* conditions under which firms seek to manipulate earnings. It also has implications for regulators to identify conditions under which firms are likely to engage in earnings management practices.

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