Journal of Modern Accounting and Auditing, ISSN 1548-6583
September 2012, Vol. 8, No. 9, 1272-1282

Reexamine Cookie Jar and Big Bath Accounting Using the Backing-Out Method

Lan Sun
University of New England, New South Wales, Australia

Prior research documents income-decreasing earnings management in the situation when true earnings exceed the targets by a substantial amount and in the situation when true earnings fall far below the targets and accounting reserves are not sufficient to reach the targets. These two situations are well-known as cookie jar and big bath earnings management. True earnings are defined as pre-managed earnings (PMEs) and are measured as reported earnings minus adjusted discretionary accruals (DAs). However, the use of PMEs can induce a spurious association between earnings management and PMEs above or below the benchmarks, which are known as the backing-out problem (Lim & Lustgarten, 2002). This study reexamines the cookie jar and big bath type of earnings management and addresses in particular the issue of backing-out problem. By using an Australian sample of 3,326 observations covering all listed firms in the Australian Securities Exchange (ASX) for a period from 1999 to 2006, this study suggests that the finding of cookie jar accounting is not simply a consequence of the backing-out problem. The results show that an income-decreasing earnings management occurs when PMEs are well above the targets. This is consistent with the first argument of cookie jar accounting—Firms reduce current earnings in order to save some income for the future. However, the results do not support the big bath accounting theory.

Keywords: earnings management, discretionary accruals (DAs), backing-out method

Introduction

One stream of research on earnings management focuses on whether managers exercise discretion to meet or beat relevant earnings benchmarks. Researchers suggest that earnings benchmarks induce earnings management, because the stock prices would normally fall if a certain benchmark cannot be met (Bartov, Givoly, & Hayn, 2002; Skinner & Sloan, 2002). Two earnings benchmarks, zero earnings and prior year's earnings, are first examined by Burgstahler and Dichev (1997). They found that managers had incentives to avoid reporting losses and earnings declines. Beatty, Ke, and Petroni (2002) further explained that markets would pay a premium to firms who had showed consistent earnings growth strings. Burgstahler and Eames (1998) added in evidence that analysts' consensus forecast was another benchmark that managers would consider to meet. Two Australian studies investigated benchmark beating. Holland and Ramsay (2003) suggested that managers manipulated earnings to report profits and to sustain last year's earnings. Prior research documents income-decreasing earnings management in the situation when true earnings exceed the targets by a substantial amount and in the situation when true earnings fall far below the targets and accounting

Lan Sun, Ph.D., senior lecturer in Finance, UNE Business School, Faculty of the Professions, University of New England. Email: lansun@une.edu.au.

reserves are not sufficient to reach the targets. These two situations are well known as cookie jar and big bath earnings management. True earnings are defined as pre-managed earnings (PMEs) and are measured as reported earnings minus adjusted discretionary accruals (DAs). However, this method can induce a spurious association between earnings management and PMEs that are below the benchmarks, which is known as the backing-out problem (Kang & Sivaramakrishnan, 1995; Lim & Lustgarten, 2002; Peasnell, Pope, & Young, 2005). The objective of this study is to reexamine the cookie jar and big bath type of earnings management. In particularly, the attempt is to address the issue of backing-out problem in testing the cookie jar and big bath type of earnings management, where error in estimating DAs will automatically lead to an equal error in the estimation of PMEs, thus, resulting in a misinterpretation. It is also an extension to the prior literature by validating the use of PMEs as a proxy for true earnings level prior manipulation that has been widely applied in the earnings management research. By using an Australian sample of 3,326 observations covering all listed firms in the Australian Securities Exchange (ASX) for a period from 1999 to 2006, this study reexamines the cookie jar and big bath type of earnings management. The results show that an income-decreasing earnings management occurs when PMEs are well above the targets. This is consistent with the first argument of cookie jar accounting—Firms reduce current earnings in order to save some income for the future. However, the results do not support the big bath accounting theory. In fact, Australian firms are more likely to increase income even when PMEs are far below the targets. Moreover, this study assesses the extent to which the findings are being driven by the backing-out problem. By using both Lim and Lustgarten's and Peasnell et al.'s methods, this study repeats all tests and concludes that initial results are not simply a consequence of the backing-out problem.

The rest of the paper is organized as follows. Section 2 provides an econometric background of backing-out method. Section 3 develops the research method and describes the data. Section 4 presents the empirical analysis of cookie jar and big bath accounting. Section 5 examines backing-out problem by using Lim and Lustgarten's (2002) method. Section 6 examines backing-out problem by using Peasnell et al.'s (2005) method. Section 7 concludes the paper.

Econometrics Background of the Backing-Out Method

The research design used in examining the link between earnings management and true earnings below certain benchmarks involves the contraction of PMEs (true earnings). The method of essentially calculating PMEs is to back out (deduct) estimates of adjusted DAs from the reported earnings. Error in estimating adjusted DAs will automatically lead to an equal error in the estimation of PMEs. This in turn can induce a spurious association between earnings management and PMEs below or above earnings benchmarks. This backing-out problem is well documented by Kang and Sivaramakrishnan (1995), Lim and Lustgarten (2002), and Peasnell et al. (2005).

The implicit argument about the backing-out problem is provided as follows. Researchers typically use Equation (1) to model benchmark beating earnings management. DA_{it} is discretionary accruals for firm *i* at year *t*. $BELOW_{it}$ is an indicator variable equals to one, if true earnings before earnings management are lower than relevant benchmarks, and zero if otherwise. A positive regression coefficient indicates that managers use positive DAs to manipulate earnings upward, when true earnings before manipulation are below earnings targets.

$$DA_{it} = \gamma_0 + \gamma_1 BELOW_{it} + \mu_{it} \quad (1)$$

Equation (1) can be further decomposed into Equation (2), where PME_{it} is true earnings before manager's manipulation; B_{it} denotes relevant benchmarks that managers try to meet.

$$DA_{it} = \gamma_0 + \gamma_1 (PME_{it} - B_{it}) + \mu_{it} \quad (2)$$

Since DA_{it} cannot be directly observed, researchers usually estimate DA_{it} by using Jones' (1991) model as follows:

$$TAC_{it} / TA_{it-1} = a_1 (1/TA_{it-1}) + a_2 (\Delta REV_{it} / TA_{it-1}) + a_3 (PPE_{it} / TA_{it-1}) + \varepsilon_{it} \quad (3)$$

$$\hat{DA}_{it} = TAC_{it} / TA_{it-1} - \hat{\alpha}_1 (1/TA_{it-1}) - \hat{\alpha}_2 (\Delta REV_{it} / TA_{it-1}) - \hat{\alpha}_3 (PPE_{it} / TA_{it-1}) \quad (4)$$

$\hat{DA}_{it}$ is estimated as a proxy for DA_{it}. Recognizing a measurement error related to the Jones' model, the true value of DAs is thereby equal to the estimated DAs plus an error term:

$$DA_{it} = \hat{DA}_{it} + \eta_{it} \quad (5)$$

Where η_{it} represents a measurement error in estimating the true DAs. Also in theory, reported earnings (E_{it}) should be equal to PMEs plus true DAs:

$$E_{it} = PME_{it} + DA_{it} \quad (6)$$

So, the regression model (Equation [2]) can be expressed as:

$$\hat{DA}_{it} + \eta_{it} = \gamma_0 + \gamma_1 [E_{it} - \hat{DA}_{it} - \eta_{it} - B_{it}] + \mu_{it} \quad (7)$$

Since $E_{it} - \hat{DA}_{it} - B_{it}$ is equivalent to $BELOW_{it}$, the model would finally be:

$$\hat{DA}_{it} + \eta_{it} = \gamma_0 + \gamma_1 [BELOW_{it} - \eta_{it}] + \mu_{it} \quad (8)$$

As the authors know, the sampled correlation coefficient is related to the slope of the sampled regression line. If $\hat{DA}_{it} + \eta_{it}$ denotes *x* and $BELOW_{it} - \eta_{it}$ denotes *y*, the coefficient γ_1 is determined as:

$$\gamma_1 = \frac{\Sigma (x_i - \overline{x})(y_i - \overline{y})}{\Sigma (x_i - \overline{x})^2} = \frac{\mathrm{cov}(x, y)}{Var(x)} \quad (9)$$

So that,

$$\gamma_1 = \frac{\mathrm{cov}(\hat{DA}_{it} + \eta_{it}, BELOW_{it} - \eta_{it})}{Var(\hat{DA}_{it} + \eta_{it})}$$
$$= \frac{\mathrm{cov}(\hat{DA}_{it}, BELOW_{it}) - \mathrm{cov}(\hat{DA}_{it}, \eta_{it}) + \mathrm{cov}(\eta_{it}, BELOW_{it}) - Var(\eta_{it})}{Var(\hat{DA}_{it} + \eta_{it})} \quad (10)$$

The above Equation (10) shows that the numerator determines the sign of coefficient γ_1 and assumes that η_{it} is the pure noise and is uncorrelated with either $\hat{DA}_{it}$ or $BELOW_{it}$ [1]. Moreover, when it is true that earnings management does not exist, it is expected that $\hat{DA}_{it}$ and $BELOW_{it}$ are unrelated, and thus $\mathrm{cov}(\hat{DA}_{it}, BELOW_{it})$ disappears. Thus:

$$\gamma_1 = -Var(\eta_{it}) \quad (11)$$

[1] Kang and Sivaramakrishnan (1995) assumed that the middle two terms in Equation (10) were zero.

Given the null hypothesis (H1) that managers do not use DAs to inflate earnings when PMEs are below the relevant benchmarks, H1 is false, and thus rejecting the H1 is equivalent to claiming that coefficient γ_1 does not equal to zero. This is likely to be the case from the above derivation. The η_{it} on both sides of the regression with opposite signs simply introduces a negative bias to the coefficient γ_1. As $Var(\eta_{it})$ is always positive, the sign of coefficient γ_1 will always be negative. This is known as the backing-out problem. Lim and Lustgarten (2002) pointed out that researchers tended to reject the H1 when it was true and interpreted that managers manipulated earnings upward (downward) when PMEs were below (above) benchmarks. This is Type Ⅰ error, which can be resolved unless the term η_{it} becomes zero. However, Dechow, Sabino, and Sloan (1998) suggested that estimation errors were likely to be present as long as DAs were estimated. Lim and Lustgarten (2002) further argued that the artificial correlation between PME and accounting discretion would be significant by construction even in the absence of earnings manipulation. To support their prediction, they used non-discretionary accruals (NDAs) to replace DAs in testing accounting discretion to smooth earnings when PMEs were below (above) the targets and found similar results by using either NDAs or DAs. They pointed out that the results using NDAs should differ from those using DAs, since NDAs were not supposed to involve earnings management. And therefore, they concluded that previous findings were simply a consequence of the mechanical association between DAs and PMEs. Therefore, the objective of this study is to reexamine the cookie jar and big bath type of earnings management. In particularly, the attempt is to address the issue of backing-out problem in testing the cookie jar and big bath type of earnings management, where error in estimating DAs will automatically lead to an equal error in the estimation of PMEs, thus, resulting in a misinterpretation.

Research Method and Data

Following Dechow, Sloan, and Sweeney (1995), DAs are used as the proxy for earnings management and are estimated through the modified Jones' model.

$$TA_{it}/A_{it-1} = \alpha_1(1/A_{it-1}) + \alpha_2(\Delta REV_{it}/A_{it-1} - \Delta AR_{it}/A_{it-1}) + \alpha_3(PPE_{it}/A_{it-1}) + \varepsilon_{it} \tag{12}$$

Where TA_{it} is total accruals being the difference between income before extraordinary items and operating cash flows; ΔREV_{it} is the change in net sales from the period t-1 to t; ΔAR_{it} is the change in account receivables from the period t-1 to t; PPE_{it} is net property, plant, and equipment; i and t are indices for firms and time periods respectively. All variables are deflated to control heteroscedasticity by total assets at the beginning year. DAs are estimated as the residuals from the modified Jones'model and NDAs are estimated as the fitted value, that is:

$$\hat{NDA}_{it} = \hat{\alpha}_1(1/A_{it-1}) + \hat{\alpha}_2(\Delta REV_{it}/A_{it-1} - \Delta AR_{it}/A_{it-1}) + \hat{\alpha}_3(PPE_{it}/A_{it-1}) \tag{13}$$

This study tests the cookie jar and big bath type of earnings management and constructs two main variables of interest $HIGH$ and LOW. $HIGH$ is an indicator variable taking the value of one if the proxy for PMEs exceeds earnings benchmarks by a large margin, and zero if otherwise. LOW on the other hand is an indicator variable taking the value of one if the proxy for PMEs falls below the short earnings benchmarks by a large margin, and zero if otherwise. Consistent with Peasnell, Pope, and Young (2000), Payne and Robb

(2000), Barua, Legoria, and Moffitt (2006), and Koh (2007), PME level (PPE_{it}) is estimated as reported earnings (E_{it}) minus DAs. This study focuses on two earnings benchmarks: Zero earnings and prior year's earnings as previous studies have reported that managers have incentives to avoid reporting losses and earnings declines (Burgstahler & Dichev, 1997). Following Peasnell et al. (2005), the large margin is defined as PMEs for firm *i* in year *t* exceeding (falling short) either of the two benchmarks, and it is above (below) 75th (25th) percentile of the distribution of the exceeding (deficit) part. Specifically, $HIGH$ is equal to one if: (1) $PME_t > 0$ and $PME_t - 0 >$ 75th percentile of the exceeding part; and (2) $PME_t > E_{t-1}$ and $PME_t - E_{t-1} >$ 75th percentile of the exceeding part respectively. LOW is equal to one if: (1) $PME_t < 0$ and $PME_t - 0 <$ 25th percentile of the deficit part; and (2) $PME_t < E_{t-1}$ and $PME_t - E_{t-1} <$ 25th percentile of the deficit part respectively. The cookie jar accounting predicts that managers will manipulate earnings downward, when PMEs are well above earnings benchmarks. Likewise, the big bath theory suggests that managers will further decrease earnings, when PMEs are well below earnings benchmarks. Therefore, the coefficients on both $HIGH$ and LOW are expected to be negative.

$$DA_{it} = \beta_0 + \beta_1 HIGH_{it} + \beta_2 LOW_{it} + \beta_3 SIZE_{it} + \beta_4 GROWTH_{it} + \beta_5 ROE_{it} + \beta_6 LEV_{it} + \beta_7 BM_{it} + \beta_8 CIR_{it} + \beta_9 LAGTA_{it} + \Sigma a_j IND_j + \varepsilon_{it} \quad (14)$$

The regression controls firm size ($SIZE_{it}$), which is measured as the logarithm of the total assets; growth opportunity ($GROWTH_{it}$) is measured by the change of sales between year *t* and *t*-1 divided by total assets at year *t*; profitability (ROE_{it}) is measured by net operating income divided by total equity; leverage (LEV_{it}) is measured by total debt to total assets; book-to-market effect ratio (BM_{it}) is measured by book value of common equity to market value of common equity; capital intensity (CIR_{it}) is measured as gross property, plant, and equipment divided by total assets; lagged total accrual ($LAGTA_{it}$) is measured as the total accruals; and industry effects (IND_j) equal one if firm *i* is from industry *j* based on Global Industry Classification Standard (GICS) industrial codes, and zero if otherwise. Robust regression analysis is used in the panel data estimation and has generated the heteroscedasticity-robust standard errors of White. The data are collected from DataStream, and the final sample has 3,326 observations covering all listed firms in the ASX for a period from 1999 to 2006.

Empirical Analysis of Cookie Jar and Big Bath Accounting

Prior research documents income-decreasing earnings management in the situation when PMEs exceed the targets by a substantial amount and in the situation when true earnings fall far below the targets and accounting reserves are not sufficient to reach the targets. These two situations are well known as cookie jar and big bath earnings management. Table 1 shows the result for PMEs benchmarked against zero, while Table 2 provides findings for PMEs benchmarked against the prior year's earnings. The coefficients on $HIGH$ are significantly negative for both benchmarks, indicating income-decreasing earnings management when PMEs are well above the targets. This is consistent with the first argument of cookie jar accounting—Firms reduce current earnings in order to save some income for the future. However, the coefficients on LOW are positive and significant at the level of 1% for both zero earnings benchmarks and prior's year earnings benchmark. This finding contradicts the prediction and indicates that Australian firms increase income even when PMEs are far below the targets. Therefore, the big bath accounting theory that managers engage in income-decreasing earnings management when true earnings fall far below the targets and accounting reserves are not sufficient to reach the targets is not supported.

Table 1

Result of Testing Cookie Jar and Big Bath Accounting Surrounding Zero Benchmark

Independent variable	Coefficient	Standard error	*t*-stat.	*p*-value
Intercept	-0.0843	0.0222	-3.80	0.0001***
HIGH	-0.0731	0.0059	-12.41	0.0000***
LOW	0.0830	0.0084	9.89	0.0000***
SIZE	0.0044	0.0015	2.86	0.0043***
GROWTH	0.0000	0.0000	0.11	0.9107
ROE	-0.0002	0.0001	-1.74	0.0825
LEV	0.0176	0.0105	1.67	0.0946**
BM	0.0029	0.0026	1.09	0.2779
CIR	0.0591	0.0127	4.65	0.0000***
LAGTA				
Industry effects:	0.0154	0.0149	1.04	0.3001
Material	-0.0299	0.0140	-2.14	0.0325
Metals and mining	0.0088	0.0139	0.64	0.5246
Industrials	0.0225	0.0141	1.60	0.1099
Consumer discretionary	0.0128	0.0153	0.84	0.4016
Consumer staples	0.0307	0.0166	1.85	0.0639**
Health care	-0.0016	0.0163	-0.10	0.9209
Information technology	0.0798	0.0195	4.09	0.0000***
Telecommunication and utilities	0.0154	0.0149	1.04	0.3001
N	3,326			
Adjusted R^2	0.2441			

Notes. (1) All variables are previously defined; (2) The estimated coefficients and *t*-statistics are adjusted with White's (1980) method; (3) *t*-statistics are one-tailed tests when the authors have explicit predictions, and two-tailed if otherwise; and (4) **, *** indicate statistical significance at the levels of 5% and 1% respectively.

Table 2

Result of Testing Cookie Jar and Big Bath Accounting Surrounding Prior Year's Earnings Benchmark

Independent variable	Coefficient	Standard error	*t*-stat.	*p*-value
Intercept	-0.0516	0.0205	-2.52	0.0119**
HIGH	-0.1358	0.0055	-24.78	0.0000***
LOW	0.0830	0.0098	8.48	0.0000***
SIZE	0.0041	0.0013	3.12	0.0018***
GROWTH	0.0000	0.0000	-0.51	0.6122
ROE	-0.0002	0.0001	-1.49	0.1358
LEV	-0.0024	0.0105	-0.23	0.8195
BM	-0.0005	0.0027	-0.16	0.8692
CIR	0.0353	0.0116	3.06	0.0022***
LAGTA				
Industry effects:	0.0243	0.0139	1.75	0.0810*

(Table 2 continued)

Independent variable	Coefficient	Standard error	*t*-stat.	*p*-value
Material	-0.0234	0.0135	-1.73	0.0832*
Metals and mining	0.0192	0.0136	1.41	0.1590
Industrials	0.0262	0.0135	1.94	0.0529*
Consumer discretionary	0.0158	0.0146	1.08	0.2800
Consumer staples	0.0200	0.0153	1.31	0.1907
Health care	0.0015	0.0156	0.10	0.9220
Information technology	0.0689	0.0181	3.81	0.0001***
Telecommunication and utilities	0.0243	0.0139	1.75	0.0810*
N	3,326			
Adjusted R^2	0.1405			

Notes. (1) All variables are previously defined; (2) The estimated coefficients and *t*-statistics are adjusted with White's (1980) method; (3) *t*-statistics are one-tailed tests when the authors have explicit predictions, and two-tailed if otherwise; and (4) *, **, *** indicate statistical significance at the levels of 10%, 5%, and 1% respectively.

Examine Backing-Out Problem Using Lim and Lustgarten's (2002) Method

To assess the extent to which the findings are being driven by the backing-out problem, this study uses Lim and Lustgarten's method and repeats all tests by using NDAs. PMEs are redefined as net income before extraordinary items minus NDAs ($PME_{it} = E_{it} - NDA_{it}$). Results using NDAs should differ from those using DAs, since NDAs are not supposed to involve earnings management. If the backing-out problem is the reason that drives empirical results in Tables 1 and 2, one would expect similar results in the models after redefining PME_{it} variable. Tables 3 and 4 show that coefficients on $HIGH_{it}$ are significantly positive, while coefficients on LOW_{it} are significantly negative for both zero benchmark and prior year's earnings benchmark. This does not consistent with initial results in Tables 1 and 2. Thus, initial results are not simply a consequence of the mechanical association between DAs and PMEs, namely, the backing-out problem.

Table 3

Examine the Backing-Out Problem in Testing Cookie Jar and Big Bath Accounting Surrounding Zero Benchmark—Lim and Lustgarten's (1998) method

Independent variable	Coefficient	Standard error	*t*-stat.	*p*-value
Intercept	0.0606	0.0239	2.54	0.0113
HIGH	0.0220	0.0058	7.44	0.0000***
LOW	-0.0067	0.0245	-1.29	0.1153
SIZE	-0.0106	0.0016	-6.64	0.0000***
GROWTH	0.0000	0.0000	-0.09	0.9309
ROE	-0.0004	0.0001	-3.48	0.0005***
LEV	0.0510	0.0171	2.99	0.0028***
BM	0.0058	0.0030	1.94	0.0521*
CIR	0.0389	0.0135	2.88	0.0040***
LAGTA				
Industry effects:				
Material	0.0131	0.0169	0.77	0.4385
Metals and mining	-0.0231	0.0155	-1.48	0.1379
Industrials	-0.0033	0.0162	-0.21	0.8369

(Table 3 continued)

Independent variable	Coefficient	Standard error	*t*-stat.	*p*-value
Consumer discretionary	0.0047	0.0159	0.29	0.7689
Consumer staples	0.0133	0.0172	0.77	0.4401
Health care	0.0564	0.0168	3.36	0.0007***
Information technology	-0.0052	0.0178	-0.29	0.7689
Telecommunication and utilities	0.0812	0.0214	3.80	0.0001***
N	3,326			
Adjusted R^2	0.0631			

Notes. (1) *, *** indicate statistical significance at the levels of 10% and 1% respectively; and (2) Source: Peasnell et al.'s (2005) method.

Table 4

Examine the Backing-Out Problem in Testing Cookie Jar and Big Bath Accounting Surrounding Prior Year's Earnings Benchmark—Lim and Lustgarten's (1998) method

Independent variable	Coefficient	Standard error	*t*-stat.	*p*-value
Intercept	0.0369	0.0223	1.65	0.0983*
HIGH	0.0353	0.0076	4.67	0.0000***
LOW	-0.0528	0.0075	-6.69	0.0000***
SIZE	-0.0072	0.0015	-4.95	0.0000***
GROWTH	0.0000	0.0001	-0.16	0.8703
ROE	-0.0005	0.0001	-3.89	0.0001***
LEV	0.0431	0.0148	2.91	0.0037***
BM	0.0042	0.0028	1.47	0.1419
CIR	0.0410	0.0133	3.08	0.0021***
LAGTA	0.0000	0.0001	0.39	0.6930
Industry effects:				
Material	0.0150	0.0164	0.91	0.3609
Metals and mining	-0.0222	0.0150	-1.48	0.1381
Industrials	-0.0008	0.0156	-0.05	0.9593
Consumer discretionary	0.0068	0.0152	0.45	0.6555
Consumer staples	0.0127	0.0165	0.77	0.4424
Health care	0.0495	0.0163	3.05	0.0023***
Information technology	-0.0057	0.0174	-0.33	0.7426
Telecommunication and utilities	0.0714	0.0206	3.47	0.0005***
N	3,326			
Adjusted R^2	0.0881			

Notes. (1) The dependent variable is *NDA*, which are measured as the difference between total accruals (reported earnings minus operating cash flows) and DAs; (2) PMEs level is defined as reported earnings minus NDA; (3) The estimated coefficients and *t*-statistics are adjusted with White's (1980) method; (4) *, *** indicate statistical significance at the levels of 10% and 1% respectively; and (5) Source: Lim and Lustgarten's (1998) method.

Examine Backing-Out Problem Using Peasnell et al.'s (2005) Method

Peasnell et al. (2005) described the backing-out problem as any error in estimating DAs, which would result in an error of equal magnitude and opposite sign in the estimation of PMEs. The solution they suggested was to use a measure of PMEs, which was not mechanically related to DAs. In their research design, they used operating cash flow as an instrumental variable to surrogate for PMEs. The underlying assumption is that operating cash flows are expected to be correlated with firm's true earnings performance, but they are not affected by the measurement error that results from the estimation of DAs. If cash flows are used as a proxy for PMEs, Equations (7) and (10) can be rewritten as:

$$\hat{DA}_{it} = \gamma_0 + \gamma_1[CF_{it} - B_{it}] + \mu_{it} \tag{15}$$

$$\gamma_1 = \frac{\text{cov}(\hat{DA}_{it}, CF_{it}) - \text{cov}(\hat{DA}_{it}, B_{it}) + \text{cov}(\eta_{it}, CF_{it}) - \text{cov}(\eta_{it}, B_{it})}{\text{var}(CF_{it}, B_{it})} \tag{16}$$

The backing-out problem is solved in this case. However, the estimation of coefficient γ_1 would be contaminated by two new errors: $\text{cov}(\hat{DA}_{it}, CF_{it})$ and $\text{cov}(\eta_{it}, CF_{it})$. Peasnell et al. (2005) raised the concern that operating cash flows itself might not be measured independent of DAs. Indeed, McNichols and Wilson (1988) found that DAs were negatively associated with operating cash flows. Dechow et al. (1995) and Guay, Kothari, and Watts (1996) suggested that errors in the measurement of DAs were inversely related to cash flows. Young (1999) found that extreme positive cash flows were associated with negative DAs. This study further checks the validity of the prediction by using operating cash flows as the proxy for PMEs. Table 5 shows the result for PMEs benchmarked against zero, while Table 6 provides findings for PMEs benchmarked against the prior year's earnings. The coefficients on *HIGH* are significantly negative for both benchmarks, indicating income-decreasing earnings management when PMEs are well above the targets. This is consistent with the cookie jar accounting argument that firms reduce current earnings in order to save some income for the future. However, the coefficients on *LOW* are significantly positive for both earnings benchmarks, which again contradict the prediction. In conjunction with the results from Tables 1 and 2, this study does not support the big bath theory. In fact, the evidence again suggests that Australian firms increase income even when PMEs are far below the targets.

Table 5
Examine the Backing-Out Problem in Testing Cookie Jar and Big Bath Accounting Surrounding Zero Benchmark

Independent variable	Coefficient	Standard error	*t*-stat.	*p*-value
Intercept	-0.0793	0.0216	-3.67	0.0000***
HIGH	-0.0511	0.0057	-14.64	0.0000***
LOW	0.0818	0.0089	9.10	0.0000***
SIZE	0.0061	0.0014	4.27	0.0000***
GROWTH	0.0000	0.0000	-0.80	0.4255
ROE	-0.0001	0.0001	-1.13	0.2596
LEV	-0.0040	0.0105	-0.38	0.7025
BM	0.0000	0.0028	-0.01	0.993
CIR	0.0346	0.0119	2.90	0.0037***
LAGTA	0.0000	0.0000	0.44	0.6614
Industry effects:				
Material	0.0262	0.0140	1.86	0.0632*
Metals and mining	-0.0218	0.0134	-1.62	0.1060
Industrials	0.0205	0.0134	1.52	0.1295
Consumer discretionary	0.0273	0.0136	2.00	0.0453**
Consumer staples	0.0197	0.0148	1.33	0.1831
Health care	0.0194	0.0155	1.25	0.2120
Information technology	0.0015	0.0157	0.09	0.9259
Telecommunication and utilities	0.0694	0.0178	3.89	0.0001***

(Table 5 continued)

Independent variable	Coefficient	Standard error	*t*-stat.	*p*-value
N	3,326			
Adjusted R^2	0.1619			

Notes. (1) The dependent variable is *DAs*; (2) PMEs levels are defined as operating cash flows; (3) The estimated coefficients and *t*-statistics are adjusted with White's (1980) method; (4) *, **, *** indicate statistical significance at the levels of 10%, 5%, and 1% respectively; and (5) Source: Peasnell et al.'s (2005) method.

Table 6
Examine the Backing-Out Problem in Testing Cookie Jar and Big Bath Accounting Surrounding Prior Year's Earnings Benchmark

Independent variable	Coefficient	Standard error	*t*-stat.	*p*-value
Intercept	0.0354	0.0226	1.56	0.1181
HIGH	-0.0085	0.0077	-2.34	0.0467**
LOW	0.0102	0.0084	2.06	0.0393**
SIZE	-0.0074	0.0015	-5.09	0.0000***
GROWTH	0.0000	0.0000	-0.32	0.7465
ROE	-0.0004	0.0001	-3.55	0.0004***
LEV	0.0386	0.0143	2.70	0.0070***
BM	0.0042	0.0028	1.46	0.1433
CIR	0.0477	0.0134	3.57	0.0003***
LAGTA	0.0000	0.0001	0.42	0.6751
Industry effects:				
Material	0.0171	0.0165	1.04	0.3000
Metals and mining	-0.0243	0.0152	-1.60	0.1099
Industrials	-0.0006	0.0157	-0.04	0.9700
Consumer discretionary	0.0109	0.0155	0.70	0.4821
Consumer staples	0.0149	0.0167	0.89	0.3733
Health care	0.0547	0.0166	3.30	0.0010***
Information technology	-0.0026	0.0177	-0.15	0.8807
Telecommunication and utilities	0.0878	0.0213	4.12	0.0000***
N	3,326			
Adjusted R^2	0.0559			

Notes. (1) The dependent variable is DAs; (2) PMEs levels are defined as operating cash flows; (3) the estimated coefficients and *t*-statistics are adjusted with White's (1980) method; (4) **, *** indicate statistical significance at the levels of 5% and 1% respectively; and (5) Source: Peasnell et al.'s (2005) method.

Conclusions

By using an Australian sample of 3,326 observations covering all listed firms in the ASX for a period from 1999 to 2006, this study reexamines the cookie jar and big bath type of earnings management. Consistent with Lim and Lustgarten (2002) and Peasnell et al. (2005), this study repeats all the tests and concludes that initial results are not simply a consequence of the backing-out problem. The results show that an income-decreasing earnings management occurs when PMEs are well above the targets. This is consistent with the first argument of cookie jar accounting—Firms reduce current earnings in order to save some income for the future. However, the results do not support the big bath accounting. In fact, Australian firms are more likely to increase income even when PMEs are far below the targets.

References

Bartov, E., Givoly, D., & Hayn, C. (2002). The rewards to meeting or beating earnings expectations. *Journal of Accounting and Economics, 33*(2), 173-204.

Barua, A., Legoria, J., & Moffitt, J. S. (2006). Accruals management to achieve earnings benchmarks: A comparison of pre-managed profit and loss firms. *Journal of Business, Finance, and Accounting, 33*(5-6), 653-670.

Beatty, A., Ke, B., & Petroni, K. (2002). Earnings management to avoid earnings declines across publicly and privately-held banks. *The Accounting Review, 77*(3), 547-570.

Burgstahler, D., & Dichev, I. (1997). Earnings management to avoid earnings decreases and losses. *Journal of Accounting and Economics, 24*(1), 99-126.

Burgstahler, D., & Eames, M. (1998). Management of earnings and analysts' forecasts to achieve zero and small positive earnings surprises. *Journal of Business, Finance, and Accounting, 33*(5-6), 633-652.

Dechow, P. M., Sabino, J., & Sloan, R. (1998). Implication of nondiscretionary accruals for earnings management and market-based research. University of Michigan.

Dechow, P. M., Sloan, R., & Sweeney, A. P. (1995). Detecting earnings management. *The Accounting Review, 70*(2), 193-225.

Guay, W. R., Kothari, S. P., & Watts, R. L. (1996). A market-based evaluation of discretionary accrual models. *Journal of Accounting Research, 34,* 83-105.

Holland, D., & Ramsay, A. (2003). Do Australian companies manage earnings to meet simple earnings benchmarks? *Accounting and Finance, 43*(1), 41-62.

Jones, J. (1991). Earnings management during import relief investigations. *Journal of Accounting Research, 29*(2), 193-228.

Kang, S. H., & Sivaramakrishnan, K. (1995). Issues in testing earnings management and an instrumental variable approach. *Journal of Accounting Research, 33,* 353-367.

Koh, P. S. (2007). Institutional investor type, earnings management, and benchmark beaters. *Journal of Accounting and Public Policy, 26*(3), 267-299.

Lim, S. C., & Lustgarten, S. (2002). Testing for income smoothing using the backing out method: A review of specification issues. *Review of Quantitative Finance and Accounting, 19*(3), 273-290.

McNichols, M., & Wilson, G. P. (1988). Evidence of earnings management from the provision for bad debts. *Journal of Accounting Research, 26*(3), 1-31.

Payne, J. L., & Robb, S. G. (2000). Earnings management: The effect of ex ante earnings expectations. *Journal of Accounting, Auditing, and Finance, 15,* 371-392.

Peasnell, K. V., Pope, P. F., & Young, S. (2000). Accrual management to meet earnings targets: UK evidence pre- and post-cadbury. *The British Accounting Review, 32*(4), 415-445.

Peasnell, K. V., Pope, P. F., & Young, S. (2005). Board monitoring and earnings management: Do outside directors influence abnormal accruals? *Journal of Business, Finance, and Accounting, 32*(7-8), 1311-1346.

Skinner, D., & Sloan, R. (2002). Earnings surprises, growth expectations, and stock returns or don't let an earnings torpedo sink your portfolio. *Review of Accounting Studies, 7*(2-3), 289-312.

Young, S. (1999). Systematic measurement error in the estimation of discretionary accruals: An evaluation of alternative modeling procedures. *Journal of Business, Finance, and Accounting, 26*(7-8), 833-862.