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The issuance of convertible bonds and earnings management: evidence from Taiwan

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Abstract

Purpose – The purpose of this paper is to examine whether companies engage in earnings management during the specific years when convertible bonds are issued and redeemed; also to determine if any differences exist in earnings management when convertible bonds are issued domestically or abroad.

Design/methodology/approach – Discretionary current accruals are adopted as proxies for earnings management and the regression models are used to control the related variables.

Findings – The empirical results indicate that companies conduct earnings management in the years when convertible bonds are issued, and that there is no significant difference between earnings management when convertible bonds are issued in Taiwan or abroad. However, data after 2001 indicate that companies issuing convertible bonds abroad perform less earnings management compared to those issuing convertible bonds domestically. The results show no significant difference in earnings management in the years when convertible bonds are redeemed; the reasons may be due to the relatively small sample size and that the majority of convertible bonds are still outstanding.

Originality/value – This paper advances findings from previous studies, that firms conducting seasoned equity offerings manage earnings upward to increase the offering proceeds. This paper highlights the linkage between convertible bonds and earnings management. Conducting an integrated analysis of the relationship between convertible bonds and earnings management, it aims to provide a better understanding of the process.

Keywords Convertible bonds, Organizational earnings, Financial management, Taiwan

Paper type Research paper

1. Introduction

If firms have valuable investment opportunities, they will raise funds from many channels. Based on the pecking order theory, firms prefer internal to external financing, and debt to equity, if they issue securities (Myers, 1984). However, capital market imperfections, such as asymmetric information, risk shifting and over investment problems, create debt- and equity-related cost of external finance (Lewis *et al.*, 2001). Convertible bonds can simultaneously mitigate both debt and equity related financing problems (Green, 1984). Furthermore, well designed convertible bonds can restore investment incentives, so that managers can make decisions that maximize a firm's value (Abhyankar and Ho, 2006).

Teoh *et al.* (1998a) and Rangan (1998) find that firms underperform in the stock market after seasoned equity issues, because investors may misinterpret high earnings reported at the time of the offering, and consequently over value the new issues. In

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related empirical work, several authors examine long run performance following convertible bonds issuance. They document that convertible bond issuing firms have substantial declines in operating performance after the issue (McLaughlin *et al.*, 1998; Lewis *et al.*, 2001). In this vein, we attempt to understand whether firms enhance investors' interests through earnings management in the year that they issue convertible bonds.

With increasing opportunities to sell products and services and to raise capital in foreign markets, firms are weighing up the benefits and costs of foreign listings. Access to foreign capital is a primary benefit. However, the largest costs for foreign listings result from accounting and disclosure requirements (Biddle and Saudagaran, 1991). Lang *et al.* (2003) indicate that cross-listing appears to be less aggressive in terms of earnings management and report accounting data that are more conservative. Thus, we try to test whether firms that issue convertible bonds overseas perform less earnings management.

Convertible bonds give creditors opportunities to convert their bonds into stocks. On these conversion terms, issuing firms have incentives to manage earnings to avoid capital pressures if they have to repay principals. In other words, these earnings management behaviors can not only boost stock prices, but also attract creditors to convert into stocks. Based on the above discussion, we wish to understand whether firms manage their earnings in the year that they redeem convertible bonds.

The purpose of this paper is threefold. The first is the examination of whether firms are engaged in upward earnings management surrounding the issuing of convertible bonds. The second purpose is to examine whether firms which issue domestic convertible bonds perform a higher level of earnings management than firms which issue overseas convertible bonds. The third purpose is to investigate whether firms conduct upward earnings management in the year when convertible bonds are redeemed.

The sample consists of firms listed in the Taiwan Stock Exchange (TSE) and Over-the-counter Securities Market (OTC) from 1990 through 2004. Empirical results show that firms conduct earnings management around issuing convertible bonds. We also find that the magnitudes of earnings management show no difference whether firms issue convertible bonds overseas or not. In addition, firms which issue convertible bonds domestically have higher magnitude of earnings management than firms which issue convertible bonds abroad in the post-Enron period. Finally, our analysis reveals that there is no significant difference in earnings management around the year of redeeming convertible bonds.

Our study contributes to the literature in several ways. The previous literature on earnings management has found considerable evidence that firms have engaged in earnings management in the year of seasoned equity offerings (Rangan, 1998). Our study is aimed at another financial instrument, convertible bonds. We explore whether convertible bonds issuers generally conduct upward earnings management in the issuing year, thereby supplementing previous studies. Second, our analysis identifies that there is no difference in earnings management between firms issuing domestic convertible bonds and firms issuing overseas convertible bonds. In addition, we do not find support for the claim that firms are engaged in more earnings management in the year when convertible bonds are redeemed. This research therefore has extended to the integration of convertible bonds and earnings management studies.

The remainder of this paper is organized as follows: Section 2 describes the related literature and hypotheses; Section 3 provides the empirical models and sample

selection; Section 4 summarizes the results; Section 5 concludes with the main findings of this study.

2. Literature review and hypothesis development

2.1 Earnings management in the issuing year

Issuance of convertible bonds has become an important source of financing. Most theoretical arguments suggest that convertible bonds, the combination of straight debt and contingent equity features built into a hybrid security, can reduce the information and agency costs companies face when raising capital from external investors (Green, 1984). These models argue that appropriately designed convertible bond offerings will help restore investment incentives so that managers will make investment decisions that maximize a firm's value (Lewis *et al.*, 2001). Consequently, issuing firms show improvements in operating performance after offerings. However, a number of studies provide different conclusions. For example, McLaughlin *et al.* (1998) find post-issue declines in operating performance subsequent to convertible bonds' issuance. Lewis *et al.* (2001) also conclude that firms, on average, perform poorly following the issuance of convertible bonds.

Prior literature indicates that firms conducting seasoned equity offerings manage earnings upward to increase the offering proceeds. Teoh *et al.* (1998b) examine the relationship between the under performance of the long run post-initial public offering (IPO) return and IPO firms' earnings management, as reflected in discretionary current accruals (DCAs). They find DCA are high around the IPO. In addition, issuers with higher discretionary accruals have poorer stock return performance in the subsequent three years. Rangan (1998) finds that earnings management over a one-year period around the offering is reliably and negatively related to market-adjusted returns in the following year.

Teoh *et al.* (1998a) examine whether pre-issue earnings management explains the long-term under performance of seasoned equity issuers. They find that DCA grow before the offering, peak in the offering year, and decline thereafter. In addition, unusually aggressive management of earnings through income-increasing accounting adjustments leads investors to be overly optimistic about the issuer's prospects. Lee and Lo (2002) investigate whether there is a significant decline in operating performance of firms after they go public. Empirical results suggest that in the context of information asymmetry, the decline of post-IPO performance is significantly correlated with the agency problem, pre-IPO earnings management and timing selection of IPO.

Several practitioners argue that managers of publicly traded firms manipulate reported earnings to increase firms' stock prices. The incentive to manage reported earnings is especially important around the time of a seasoned equity offering (Rangan, 1998). In contrast to these studies, we focus on another financial instrument, convertible bonds, and attempt to investigate whether firms perform unusually aggressive earnings management in the issuing year. Hence, the related hypothesis is established as follows:

H1. Firms issuing convertible bonds are engaged in more earnings management in the issuing year.

2.2 Where convertible bonds are issued and earnings management

According to the Securities and Futures Institute's[1] statistics, the proportion of funds from overseas capital markets of Taiwan's listed companies has grown in recent years.

Overseas convertible bonds and American depository receipts (ADR) are the most popular foreign financing instruments. Foreign listings can reduce capital costs as well as offer marketing, political, and employee relationship advantages. However, when firms enter foreign markets, they also must adjust accounting and auditing procedures to meet local requirements (Biddle and Saudagaran, 1991). Lang *et al.* (2003) investigate whether firms cross-listing in the US exchanges have higher quality accounting information. They find that cross-listing firms have better managerial incentive alignment, and hence, a stronger predisposition toward transparency before listing, and are more willing to align themselves to greater transparency and to further improvements in reporting after listing.

Information asymmetry affects management incentives to manage earnings (Richardson, 2000). That is, the presence of information asymmetry between firm management and firm shareholders is a necessary condition for earnings management (Trueman and Titman, 1988). Glosten and Milgrom (1985) point out that one persistent adverse selection problem facing market makers is the possibility that material firm-specific information has not been publicly disclosed by a firm. Lang and Lundholm (1996) examine the relationship between the disclosure practices of firms, the number of analysts following each firm, and properties of the analysts' earnings forecasts. They provide evidence that firms with more informative disclosure policies have larger "following-analysts", more accurate analyst earnings forecasts, less dispersion among individual analyst's forecasts, and less volatility in forecast revisions. Richardson (2000) proposes that when information asymmetry is serious, stakeholders may not have the necessary information to undo the manipulated earnings. The existence of firms with high levels of information asymmetry provides evidence of shareholders without sufficient resources, incentives, or access to relevant information to monitor manager's action, which may give rise to the practice of earnings management.

Overseas convertible bonds are one kind of foreign financing instruments. Regulatory authorities in most countries require foreign firms to prepare financial disclosures in accordance with local reporting requirements (Biddle and Saudagaran, 1991). This may bring cross-listing firms' financial reporting to be more transparent. Upon this, compared to firms issuing domestic convertible bonds, firms issuing overseas convertible bonds should have lower level of earnings management. Hence, the related hypothesis is established as follows:

H2. Firms which issue domestic convertible bonds have a higher level of earnings management than firms which issue overseas convertible bonds.

2.3 Earnings management in the redeeming year

Lewis *et al.* (1999) suggest that two distinct but not mutually exclusive theories can explain firms' decision to issue convertible bonds: risk-shifting hypothesis and backdoor-equity hypothesis. First, the risk-shifting hypothesis argues that convertible bonds are a substitute for straight debts, and this substitution is most likely to occur in firms facing significant risk in their investment opportunity sets (Lewis *et al.*, 1999). Green (1984) provides a theoretical model of this perspective. Further, convertible bonds can mitigate adverse investment incentives created by risk-shifting problems and managerial discretion. That is, conversion features impose a payoff structure on the equity holders' residual claim that affects the incentive to over invest in risky projects. Different designs of the convertible debt contract can control the shape of the equity's payoff structure, and hence firms' investment incentives.

Second, the backdoor-equity hypothesis states that managers substitute convertible bonds for common equity to mitigate the adverse selection costs of a seasoned equity offering (Lewis *et al.*, 1999). Stein (1992) provides a theoretical model of this perspective. Firms may use convertible bonds as an indirect method for implementing equity financing when they face significant information asymmetry and management is optimistic about firms' future performance. That is, convertible bonds are uniquely structured to allow managers to obtain financing immediately through a delayed equity offering. The motivation for issuing convertible bonds is to obtain common equity financing at a better price than the stock price on the issuance date.

Firms prefer to issue straight debt with its lower issue costs and minimal adverse-selection costs; however, debt issuances increase leverage and costs of financial distress. Thus, convertibles present an attractive alternative for equity or straight-debt issues (Stein, 1992). Teoh *et al.* (1998a) and Rangan (1998) suggest that firms conducting seasoned offerings manage earnings upward in order to manipulate their stock price. If firms attempt to increase creditors' willingness to switch their convertible bonds into stock, they may conduct earnings management in the redeeming year. Hence, the related hypothesis is established as follows:

H3. Firms are engaged in more earnings management in the year convertible bonds are redeemed.

3. Research method

3.1 Measurement of earnings management

Tests of earnings management generally assume earnings are managed through changes in accounting procedures, through specific transactions such as debt defeasance or write-downs, and through discretion over accruals (McNichols and Wilson, 1988). Compared with other ways, accruals changes are less likely to attract attention from politicians and the public (Han and Wang, 1998). Healy (1985) uses accruals as a surrogate for earnings management, and tests how managers' bonds plan incentives affect their accruals choices. Becker *et al.* (1998) suggest that discretionary accruals can capture the net effect of all accounting choices that impact reported income.

Accruals can be classified into two categories, based on time period and managerial control. Current accruals adjustments involve short-term assets and liabilities that support the day-to-day operations of the firm. On the other hand, long-term accruals adjustments, which involve long-term net assets, can be increased by decelerating depreciation, decreasing deferred taxes or realizing unusual gains. Many researchers argue that managers have greater discretion over current accruals than over long-term accruals (Guenther, 1994; Teoh *et al.*, 1998a; Das and Zhang, 2003; Chang and Fang, 2006). The main purpose of this study is to test the earnings management behavior of firms in the years that they issue and redeem convertible bonds. We propose that firms attempt to aggressively manage earnings through current accruals adjustments, and in turn influence capital suppliers' decisions.

Following Teoh *et al.* (1998a), we use DCAs as a proxy for earnings management. Details of the procedure are described as follows:

$$CA_{\mathrm{it}} = (\Delta CASSET_{\mathrm{it}} - \Delta CASH_{it}) - (\Delta CL_{\mathrm{it}} - \Delta LD_{\mathrm{it}}) \quad (1)$$

where,

CA_{it} = the current accruals for firm i in year t;

$\Delta CASSET_{\mathrm{it}}$ = the change in current assets from year t to year $t - 1$ for firm i;

$\Delta CASH_{it}$ = the change in cash and cash equivalents from year t to year $t-1$ for firm i;
ΔCL_{it} = the change in current liability from year t to year $t-1$ for firm i;
ΔLD_{it} = the change in current maturity of long-term debts from year t to year $t-1$ for firm i.

The time-series model is used in the study. This approach is widely adopted to investigate whether or how earnings are managed during event years (Guenther, 1994; Han and Wang, 1998; Monem, 2003; Appendix).

Having estimated firm-specific current accruals, we ran ordinary least squares (OLS) regression from Equation (2) to estimate the coefficients, $\hat{\alpha}_0$ and $\hat{\alpha}_1$. Because the frequency of companies in some industries is low, we used the procedure proposed by Young and Wu (2003) and Chang *et al.* (2007). Following this method, we pooled a few similar industries into one category and exclude the paper, automobile, and glass and ceramic industries from data. Next, we used the coefficient estimates from Equation (2) to predict non-DCAs ($NDCA_{it}$). Finally, as estimated with Equation (4), DCAs were calculated as the difference between total current accruals and non-DCAs.

$$\frac{CA_{it}}{TA_{it-1}} = \alpha_0\left(\frac{1}{TA_{it-1}}\right) + \alpha_1\left(\frac{\Delta SALE_{it}}{TA_{it-1}}\right) + \varepsilon_{it} \tag{2}$$

where,
$\Delta SALE_{it}$ = the change in sales from year t to year $t-1$ for firm i;
TA_{it-1} = the total assets for firm i in year $t-1$.

$$NDCA_{it} = \hat{\alpha}_0\left(\frac{1}{TA_{it-1}}\right) + \hat{\alpha}_1\left(\frac{\Delta SALE_{it} - \Delta AR_{it}}{TA_{it-1}}\right) \tag{3}$$

where,
ΔAR_{it} = the change in net account receivables from year t to year $t-1$ for firm i;
$NDCA_{it}$ = the non-DCAs for firm i in year t.

$$DCA_{it} = \frac{CA_{it}}{TA_{it-1}} - NDCA_{it} \tag{4}$$

3.2 Control variables and specification of the empirical model

Previous research identifies several additional factors that may influence the magnitude of discretionary accruals (Reynolds and Francis, 2001). Therefore, we control the effects of these factors which are likely to affect DCAs. These control variables are as follows:

- Firm size ($SIZE_{it}$): Becker *et al.* (1998) and Reynolds and Francis (2001) indicate that company size may be correlated with discretionary accruals. According to Becker *et al.* (1998), company size here is measured as natural logarithm of total assets and we expect a positive sign for this variable.
- Leverage (LEV_{it}): Leverage is defined as the ratio of total debts to total assets. The relationship between leverage and discretionary accruals is mixed. For example, DeFond and Jiambalvo (1994) find that companies with higher debt level have a greater incentive to use accruals to increase earnings due to closeness to debt

covenant constraints. However, DeAngelo *et al.* (1994) argue that troubled companies have large negative accruals related to contractual renegotiations that provide incentives to reduce earnings. Therefore, we do not predict the sign of the relationship between leverage and accruals.

- Operating cash flows (CFO_{it}): Operating cash flows is defined as cash flows from operations scaled by total assets. Dechow (1994) and Dechow *et al.* (1995) suggest that cash flow noise arises from either normal operating or manipulative variation in firms' working capital and other investment decision. That is, accruals and operating cash flows are negative, because accruals offset transitory cash flow effects. Therefore, we include the additional control for this effect and expect the coefficient on CFO_{it} to be negative.
- Absolute value of total accruals ($ABSTA_{it}$): Krishnan (2003) indicates that firms with higher absolute values of total accruals are likely to have greater discretionary accruals. Thus, this study includes the absolute value of total accruals divided by total assets as a control variable. We expect the coefficient on $ABSTA_{it}$ to be positive.
- Lagged DCA (DCA_{it-1}): Given that discretionary accruals are expected to be zero over time, managers' ability to borrow or save earnings in the current period could be affected by the extent to which earnings were borrowed or saved in previous periods (Sloan, 1996; DeFond and Park, 1997; Kim *et al.*, 2003). To control its potential effect on our test results, we also include DCA_{it-1} as a control variable. The coefficient on DCA_{it-1} is expected to be negative.

Specifically, the model employed in this study to test *H1* is expressed as follows:

$$DCA_{it} = \beta_0 + \beta_1 DUM1(2)_i + \beta_2 SIZE_{it} + \beta_3 LEV_{it} + \beta_4 CFO_{it} + \beta_5 ABSTA_{it} + \beta_6 DCA_{it-1} + \varepsilon_{it} \quad (5)$$

where,

DCA_{it} = the discretionary current accruals for firm i in year t;
$SIZE_{it}$ = the natural logarithm of total assets for firm i in year t;
LEV_{it} = the ratio of total debts to total assets for firm i in year t;
CFO_{it} = the operating cash flows divided by total assets for firm i in year t;
$ABSTA_{it}$ = the absolute value of total accruals scaled by total assets for firm i in year t;
DCA_{it-1} = the discretionary current accruals for firm i in year $t - 1$;
$DUM1_i$ = a dummy variable, 1 if firm i issues convertible bonds in year t, 0 otherwise;
$DUM2_i$ = a dummy variable, 1 if firm i issues convertible bonds last year, 0 otherwise.

Moreover, to compare with firms which do not issue convertible bonds, we followed the procedure recommended by Kothari *et al.* (2005). Specifically, we matched each issuing firm with a comparable firm that has not issued convertible debts in the same industry and with a similar return on assets (ROA).

H2 investigates whether firms which issue domestic convertible bonds and firms which issue overseas convertible bonds have different degrees of earnings management. A dummy variable is added to the regression equation. The model is therefore estimated as follows:

$$DCA_{it} = \beta_0 + \beta_1 DUM_i + \beta_2 SIZE_{it} + \beta_3 LEV_{it} + \beta_4 CFO_{it} + \beta_5 ABSTA_{it} + \beta_6 DCA_{it-1} + \varepsilon_{it} \quad (6)$$

where,

DUM_i = a dummy variable, 1 if firm i issues overseas convertible bonds, 0 otherwise.

H3 tests the earnings management behavior around the year when firms redeem their convertible bonds. The following empirical model is employed to test the hypothesis:

$$DCA_{it} = \beta_0 + \beta_1 DUM3(4)_i + \beta_2 SIZE_{it} + \beta_3 LEV_{it} + \beta_4 CFO_{it} + \beta_5 ABSTA_{it} + \beta_6 DCA_{it-1} + \varepsilon_{it} \quad (7)$$

where,

$DUM3_i$ = a dummy variable, 1 if firm i redeems convertible bonds in year t, 0 otherwise;

$DUM4_i$ = a dummy variable, 1 if firm i redeems convertible bonds last year, 0 otherwise.

3.3 Data and sample selection

Variables used to construct our empirical analysis are from:

- the *Taiwan Economic Journal* (*TEJ*)[2] database; and
- the Securities and Futures Institute (SFI) database for expiration dates of convertible bonds.

Our sample consists of listed and OTC companies, excluding financial institutions.

The sample used to test *H1* and *H2* covers 15 years from 1990 to 2004. In addition, two criteria must be met. First, the sample is limited to convertible bonds issuers. Second, if a firm has multiple issues, we include only the earliest issue to avoid using overlapping data to estimate our empirical coefficients[3].

For *H3*, we further required issuing firms to meet the following criteria. First, firms issued convertible bonds between 1990 and 1998[4]. Second, firms redeemed their convertible bonds before 2005. Finally, firms which issued new convertible bonds around the maturity dates are deleted.

Panel A of Table I lists the sample distribution by location and year. Of the 423 firms, 286 issue domestic convertible bonds and 137 issue overseas convertible bonds. As shown in Panel B of Table I, the sample concentrates on the electronics industry (66.67 percent), while Panel C of Table I reports the industry distribution in redeeming convertible bonds of our sample. The full data set comprises 75 firms, 60 of which are early redeemed.

4. Empirical results

4.1 Descriptive statistics

Panel A of Table II provides descriptive statistics for all variables used in *H1* and *H2* tests. The mean DCA is 0.035, while the median is 0.020, indicating a rightward skewness. The mean natural logarithm of total assets (Size) is 6.702, while the median is 6.635, displaying a slight rightward skewness. Furthermore, the mean LEV, ratio of

total debts to total assets, is 0.431, while the median is 0.432. The mean operating cash flows (divided by total assets) (CFO) is 0.055, while the median is 0.056. Therefore, the means of LEV and CFO are similar to the medians. Additionally, the mean absolute value of total accruals (deflated by total assets) (ABSTA) is 0.082, while the median is 0.061, also exhibiting a rightward skewness. Finally, the mean DCA_{t-1} is 0.035, while the median is 0.017, and displays a rightward skewness as well.

Panel B of Table II shows descriptive statistics for the sample of *H3*. The mean of DCA is −0.025, while the median is −0.023. The mean of SIZE is 7.278, while the median is 7.230. Both the mean and the median of LEV are 0.424. Moreover, the mean of CFO is 0.054, while the median is 0.050. The mean of ABSTA is 0.077, while the median

Year	Domestic convertible bonds No. of firms	Percent	Overseas convertible bonds No. of firms	Percent	Total	Percent
Panel A: Distribution of convertible bonds by location and year						
1991	7	2.45	2	1.46	9	2.13
1992	3	1.05	1	0.73	4	0.95
1993	0	0.00	0	0.00	0	0.00
1994	0	0.00	15	10.95	15	3.55
1995	1	0.35	1	0.73	2	0.47
1996	3	1.05	4	2.92	7	1.65
1997	12	4.20	8	5.84	20	4.73
1998	16	5.59	4	2.92	20	4.73
1999	7	2.45	2	1.46	9	2.13
2000	16	5.59	7	5.11	23	5.44
2001	26	9.09	0	0.00	26	6.15
2002	43	15.03	12	8.76	55	13.00
2003	53	18.53	45	32.85	98	23.17
2004	99	34.62	36	26.28	135	31.91
Total	286	100.00	137	100.00	423	100.00

Codes	Industry	No. of firms	Percent
Panel B: Industry distribution of firms			
11,20,25,55	Cement, steel and iron, construction	28	6.62
12,42	Foods	5	1.18
13,43,17,47,21	Plastics, chemistry, rubber, biotechnology	33	7.80
14,44,41	Textiles	14	3.31
15,45,16	Electric machinery, machinery, wire and cable	29	6.86
23,24,30,52 ~ 54,61,62,80,81	Electronics	282	66.67
25,57,29,59	Tourism, department stores	11	2.60
	Others	21	4.96
Total		423	100

(*continued*)

Table I.
Sample compositions

Industry	Redeeming convertible bonds at maturity No. of firms	Percent	Early redemption No. of firms	Percent	Total	Percent
Panel C: Industry distribution in redeeming convertible bonds						
Cement, steel and iron, construction	5	33.3	8	13.3	13	17.3
Foods	1	6.7	1	1.7	2	2.7
Plastics, chemistry, rubber, biotechnology	0	0.0	10	16.7	10	13.3
Textiles	0	0.0	5	8.3	5	6.7
Electric machinery, machinery, wire and cable	5	33.3	3	5.0	8	10.7
Electronics	2	13.3	31	51.7	33	44.0
Tourism, department stores	2	13.3	0	0.0	2	2.7
Others	0	0.0	2	3.3	2	2.7
Total	15	100.0	60	100.0	75	100.0

Table I.

Variables	Mean	Standard deviation	Min.	Max.	Q1	Median	Q3
Panel A: Descriptive statistics of sample for H1 *and* H2							
DCA_{it}	0.035	0.140	−1.007	1.007	−0.030	0.020	0.083
$SIZE_{it}$	6.702	0.562	5.375	8.360	6.301	6.635	7.015
LEV_{it}	0.431	0.121	0.076	0.856	0.345	0.432	0.508
CFO_{it}	0.055	0.108	−0.485	0.516	0.001	0.056	0.118
$ABSTA_{it}$	0.082	0.083	0.000	0.746	0.027	0.061	0.110
DCA_{t-1}	0.035	0.152	−1.007	1.007	−0.035	0.017	0.086
Panel B: Descriptive statistics of sample for H3							
DCA_{it}	−0.025	0.078	−0.520	0.320	−0.064	−0.023	0.007
$SIZE_{it}$	7.278	0.481	6.210	8.440	6.932	7.230	7.637
LEV_{it}	0.424	0.139	0.110	0.860	0.316	0.424	0.514
CFO_{it}	0.054	0.094	−0.370	0.510	0.012	0.050	0.090
$ABSTA_{it}$	0.077	0.087	0.000	0.670	0.028	0.052	0.092
DCA_{t-1}	−0.019	0.084	−0.260	0.470	−0.065	−0.020	0.013

Notes: DCA_{it} is discretionary current accruals for firm i in year t; $SIZE_{it}$ is natural logarithm of total assets for firm i in year t; LEV_{it} is ratio of total debts to total assets for firm i in year t; CFO_{it} is operating cash flows divided by total assets for firm i in year t; $ABSTA_{it}$ is the absolute value of total accruals scaled by total assets for firm i in year t; DCA_{t-1} is discretionary current accruals for firm i at time $t-1$. The sample in Panel A contains 1,269 firm-year observations. The sample in Panel B contains 215 firm-year observations

Table II.
Descriptive statistics

is 0.052, indicating a rightward skewness. Finally, the mean of DCA_{t-1} is −0.019, while the median is −0.020.

4.2 Correlation analysis

Panel A of Table III presents the correlations between DCA and other variables used in *H1* and *H2* tests. Pearson correlations indicate that DCA is negatively correlated with

	DCA_{it}	$SIZE_{it}$	LEV_{it}	CFO_{it}	$ABSTA_{it}$	DCA_{t-1}	*Dum*1	*Dum*2
Panel A: Correlation coefficients of sample for H1 *and* H2								
DCA_{it}		−0.099**	0.017	−0.064**	0.125***	0.069**	0.173***	−0.032
$SIZE_{it}$	−0.068**		0.072**	0.008	−0.039	−0.095***	0.014	0.100***
LEV_{it}	0.002	0.065**		−0.348***	0.096***	−0.028	0.098***	0.085***
CFO_{it}	−0.124***	0.042	−0.329***		−0.077***	0.010	−0.061**	0.011
$ABSTA_{it}$	0.164***	−0.052*	0.121***	−0.268***		0.097***	−0.001	0.002
DCA_{t-1}	−0.084***	−0.065**	−0.032	0.022	0.094***		−0.123***	0.196***
*Dum*1	0.152***	0.013	0.101***	−0.063**	−0.003	−0.082***		−0.500***
*Dum*2	−0.062**	0.093***	0.097***	0.042	0.009	0.148***	−0.500***	

	DCA_{it}	$SIZE_{it}$	LEV_{it}	CFO_{it}	$ABSTA_{it}$	DCA_{t-1}	*Dum*3	*Dum*4
Panel B: Correlation coefficients of sample for H3								
DCA_{it}		0.136*	−0.193***	−0.074	0.024	0.135***	0.092	−0.089
$SIZE_{it}$	0.078		−0.033	−0.058	−0.166**	0.103	0.013	0.042
LEV_{it}	−0.216***	−0.077		−0.333***	−0.054	−0.221***	−0.032	−0.033
CFO_{it}	−0.139**	0.017	−0.299***		0.233***	0.120*	0.056	−0.056
$ABSTA_{it}$	0.091	−0.235***	0.097	0.151**		0.108	0.132**	−0.073
DCA_{t-1}	0.177***	0.087	−0.184***	0.043	0.211***		−0.058	0.026
*Dum*3	0.088	0.006	−0.047	0.051	0.064	−0.043		−0.500***
*Dum*4	−0.115*	0.050	−0.017	−0.031	−0.061	0.015	−0.500***	

Notes: DCA_{it} is discretionary current accruals for firm i in year t; $SIZE_{it}$ is natural logarithm of total assets for firm i in year t; LEV_{it} is ratio of total debts to total assets for firm i in year t; CFO_{it} is operating cash flows divided by total assets for firm i in year t; $ABSTA_{it}$ is the absolute value of total accruals scaled by total assets for firm i in year t; DCA_{t-1} is discretionary current accruals for firm i at time $t-1$; *Dum*1 is a year dummy variable coded 1 if firm i issues convertible bonds in year t, zero otherwise; *Dum*2 is a year dummy variable coded 1 if firm i issues convertible bonds last year, zero otherwise. *Dum*3 is a year dummy variable coded 1 if firm i redeems convertible bonds in year t, zero otherwise; *Dum*4 is a year dummy variable coded 1 if firm i redeems convertible bonds last year, zero otherwise. Pearson coefficient in the lower triangle; Spearman coefficient in the upper triangle. *, **, and *** indicate significance at 10, 5, and 1 percent levels, respectively, for a two-tailed test

Table III.
Correlation coefficients

SIZE, CFO, DCA_{t-1}, and Dum2. This suggests that larger size, higher operating cash flows, more DCAs the previous year and firms issuing convertible bonds the previous year are associated with less DCAs. In addition, DCA is positively correlated with ABSTA, suggesting that higher absolute value of total accruals has more DCAs. Finally, the correlation between DCA and Dum1 is positive, as predicted, and statistically significant at the 0.01 level. This shows that the years when convertible bonds are issued possess more DCAs.

Correlations among variables used in *H3* are presented in Panel B of Table III. From Pearson correlations matrix, it reveals that there is a positive correlation coefficient between DCA and DCA_{t-1}. DCA is negatively correlated with LEV and CFO. DCA is also negatively correlated with Dum4, indicating that firms redeeming convertible bonds during the previous year have lower DCAs.

Overall, the correlations among the independent variables used in the models are quite low, with the highest correlation being 0.5. Similarly, the highest variance inflation factor (VIF) is less than 10[5], suggesting that multicollinearity is not a problem.

4.3 Preliminary test

One-way analysis of variance (ANOVA) is used to test the difference in DCA among the three years. Table IV outlines the results of ANOVA and post hoc Scheffe's test. The results indicate that the mean DCA significantly differs between the three years (F statistic = 15.184, p-value = 0.000). Scheffe's multiple pairwise comparison test results illustrate that the changes in DCA from year $T-1$ to year T and from year T to year $T+1$ are significant. However, the change in DCA from year $T-1$ to year $T+1$ is not significant. Thus, results from these comparisons are consistent with *H1*. That is, DCA is significantly greater in the year when firms issue convertible bonds. Nevertheless, a problem with drawing conclusion from univariate tests is that they fail to control the numerous factors associated with DCA. Thus, we further relied on regression analyses to formally test our hypotheses.

As shown in Table V, ANOVA was used to evaluate differences in DCA between domestic and overseas convertible bonds. The results show that the difference in mean of DCA for domestic and overseas convertible bonds is significant (F statistic = 3.028, p-value = 0.082). The DCA mean scores for domestic and overseas convertible bonds are 0.040 and 0.026, respectively. That is, DCA was significantly greater for domestic convertible bonds. These findings are consistent with *H2*.

4.4 Results of regression analysis

4.4.1 Test results of H1. Table VI reports the regression results of DCA on a year dummy variable and several control variables, providing evidence for *H1*. The coefficients of the year dummy variable are significantly positive for specifications 1A and 1C ($\beta = 0.056, p < 0.01$; $\beta = 0.024, p < 0.05$). These results indicate that firms issuing convertible bonds have more DCA in year T than in year $T-1$, and have more DCA in year $T+1$ than in year $T-1$. Additionally, the coefficients of the year

Year		Mean	Difference in means		p-value
$T-1$	(n=423)	0.017	−0.048	($T-1$ vs. T)	0.000*
T	(n=423)	0.065	0.042	(T vs. $T+1$)	0.000*
$T+1$	(n=423)	0.023	0.005	($T+1$ vs. $T-1$)	0.850
		F statistic = 15.184; p-value = 0.000			

Table IV. ANOVA and Scheffe's test results for differences in discretionary current accruals between two years

Notes: T–1, T and $T+1$ represent the last year before issuing convertible bonds, issuing convertible bonds year and the first year after issuing convertible bonds, respectively; * indicates significance at 1 percent

	n	Mean	Standard deviation	F-stat.	p-value
Domestic convertible bonds	825	0.040	0.144	3.028	0.082*
Overseas convertible bonds	444	0.026	0.130		
Total	1,269	0.035	0.140		

Table V. ANOVA test results for differences in discretionary current accruals between two locations

Notes: * Indicates significance at 10 percent

Table VI. Regression analysis results of earnings management around issuing convertible bonds (experimental group)

$$DCA_{it} = \beta_0 + \beta_1 DUM1(2)_i + \beta_2 SIZE_{it} + \beta_3 LEV_{it} + \beta_4 CFO_{it} + \beta_5 ABSTA_{it} + \beta_6 DCA_{it-1} + \varepsilon_{it}$$

	Predicted	$T-1$ vs. T (1A)				T vs. $T+1$ (1B)				$T-1$ vs. $T+1$ (1C)			
	signs	Coefficients	t-stat.	p-value	VIF	Coefficients	t-stat.	p-value	VIF	Coefficients	t-stat.	p-value	VIF
Intercept		0.117	1.736	0.083*		0.211	3.749	0.000***		0.067	1.056	0.292	
$Dum1_i$	+	0.056	5.130	0.000***	1.046								
$Dum2_i$	–					–0.039	–4.386	0.000***	1.035	0.024	2.332	0.020**	1.079
$SIZE_{it}$	–	–0.016	–1.686	0.092*	1.009	–0.021	–2.718	0.007***	1.014	–0.005	–0.530	0.596	1.021
LEV_{it}	?	–0.061	–1.248	0.212	1.212	–0.031	–0.769	0.442	1.153	–0.088	–2.037	0.042**	1.191
CFO_{it}	–	–0.112	–2.096	0.036**	1.308	–0.088	–1.933	0.054*	1.211	–0.030	–0.570	0.569	1.150
$ABSTA_{it}$	+	0.439	6.121	0.000***	1.179	0.176	3.321	0.001***	1.067	0.170	2.861	0.004***	1.052
DCA_{it-1}	–	–0.099	–2.923	0.004***	1.017	–0.030	–1.009	0.313	1.037	–0.138	–4.100	0.000***	1.065
F-stat.			16.026	0.000***			8.642	0.000***			4.529	0.000***	
Adjusted R^2			0.109				0.051				0.028		

Notes: DCA_{it} is discretionary current accruals for firm i at time t; $Dum1_i$ is a year dummy variable coded 1 if firm i issues convertible bonds in year t, zero otherwise; $Dum2_i$ is a year dummy variable coded 1 if firm i issues convertible bonds last year, zero otherwise; $SIZE_{it}$ is natural logarithm of total assets for firm i in year t; LEV_{it} is ratio of total debts to total assets for firm i in year t; CFO_{it} is operating cash flows divided by total assets for firm i in year t; $ABSTA_{it}$ is the absolute value of total accruals scaled by total assets for firm i in year t; DCA_{it-1} is discretionary current accruals for firm i at time $t-1$. $T-1$, T and $T+1$ represent the last year before issuing convertible bonds, issuing convertible bonds year and the first year after issuing convertible bonds, respectively; *, **, and *** indicate significance at 10, 5 and 1 percent levels, respectively; $n = 423$

dummy variable are significantly negative for specification 1B ($\beta = -0.039, p < 0.01$), indicating DCA declines in the first year after issuing convertible bonds.

To sum it up, the above evidence shows that DCA is higher in the year that firms issue convertible bonds. This is probably because firms manage earnings upward in order to appeal to investors. Therefore, the magnitude of earnings management in issuing year is higher. Moreover, DCA is higher in the first year after issuing convertible bonds than in the year previous to the issuing of convertible bonds. This is perhaps because creditors can convert their convertible bonds into stocks over one- or six-month period after maturity. Firms have incentives to manage earnings upwards to maximize the price for their stocks; in turn creditors are willing to convert bonds into stocks. By considering them together, these results support *H1*.

To check the robustness of our results, we further examined earnings management for firms which do not issue convertible bonds (control group). Based on Lang *et al.* (2003), we computed DCA of the control group, and then compared the regression results between issuing firms and non-issuing firms. Table VII shows the results for the control group. The coefficients of the year dummy variable are not significant for all specifications, suggesting that DCA does not increase significantly. Therefore, this finding is robust regarding *H1*.

4.4.2 Test results of H2. The second hypothesis is to investigate whether the level of earnings management is higher for firms which issue domestic convertible bonds than for firms which issue overseas convertible bonds. As shown in Table VIII, the coefficient on Dum_i is −0.004 with a *t*-statistic of −0.389, which is not significant. The results suggest that there is no difference in terms of earnings management behavior in firms issuing domestic convertible bonds and firms issuing overseas convertible bonds. Thus, the empirical findings do not support *H2*.

Prior research points out that earnings management behavior is likely impacted by certain events (Han and Wang, 1998; Fu *et al.*, 2005; Yang and Guan, 2006) or by government regulations (Guenther, 1994; Monem, 2003). In recent years, corporate failures and accounting scandals have triggered a crisis of confidence in the reliability and integrity of financial reports. Particularly, the sudden collapse of Enron has led to the passage of the Sarbanes-Oxley Act, a sweeping American Federal law with broad corporate governance implications.

Fu *et al.* (2005) demonstrate that auditors issued non-standard unqualified audit reports more frequently after the Enron scandal. Yang and Guan (2006) found that compared to the pre-Enron period, auditors tend to adopt a more conservative strategy, due to a greater focus on reputation protection in the post-Enron period.

We classified the sample into two groups, guided by the year when the Enron scandal emerged, 2001. This partitioning technique results in the comparison of sub-sample periods of 1990-2001 ($n = 434$) vs 2002-2005 ($n = 834$). Table IX presents the results of the estimation of Equation (6) for the two groups. For the pre-Enron group, the coefficient for β_1 is positive and not significant ($\beta = 0.020, p > 0.01$). For the post-Enron group, the coefficient for β_1 is negative and significant ($\beta = -0.024, p < 0.05$). These findings suggest that the level of earnings management is lower for firms which issued overseas convertible bonds in the post-Enron period. Thus, *H2* is supported by using the post-Enron scandal data.

4.4.3 Test results of H3. The test results on *H3* are reported in Table X. The year dummy variable estimates are not significant for specifications 3A and 3C ($\beta = 0.004$, $p > 0.10$; $\beta = -0.017$, $p > 0.10$) although the direction of the coefficients is as expected. However, the estimated coefficients on the year dummy variable are

Table VII. Regression analysis results of earnings management around issuing convertible bonds (control group)

$$DCA_{it} = \beta_0 + \beta_1 DUM1(2)_i + \beta_2 SIZE_{it} + \beta_3 LEV_{it} + \beta_4 CFO_{it} + \beta_5 ABSTA_{it} + \beta_6 DCA_{it-1} + \varepsilon_{it}$$

		$T-1$ vs. T (1A)				T vs. $T+1$ (1B)				$T-1$ vs. $T+1$ (1C)			
	Predicted signs	Coefficients	*t*-stat.	*p*-value	VIF	Coefficients	*t*-stat.	*p*-value	VIF	Coefficients	*t*-stat.	*p*-value	VIF
Intercept		−0.279	−3.797	0.000***		−0.353	−4.873	0.000***		0.045	0.582	0.582	
$Dum1_i$	+	−0.007	−0.617	0.538	1.004								
$Dum2_i$	−					−0.018	−1.603	0.109	1.008	−0.010	0.453	0.453	1.003
$SIZE_{it}$	−	0.048	4.326	0.000***	1.010	0.059	5.433	0.000***	1.008	0.004	0.733	0.733	1.011
LEV_{it}	?	−0.076	−1.937	0.053*	1.090	−0.076	−1.915	0.056*	1.123	−0.173	0.000	0.000***	1.088
CFO_{it}	−	−0.091	−1.496	0.135	1.124	−0.116	−1.975	0.049**	1.107	−0.148	0.022	0.022**	1.063
$ABSTA_{it}$	+	0.061	0.744	0.457	1.071	−0.007	−0.091	0.927	1.024	−0.017	0.848	0.848	1.026
DCA_{it-1}	−	−0.007	−0.855	0.393	1.005	−0.047	−1.232	0.218	1.010	−0.012	0.283	0.283	1.004
F-stat.			4.015	0.001***			6.385	0.000***			3.258	0.004***	
Adjusted R^2			0.024				0.037				0.018		

Notes: DCA_{it} is discretionary current accruals for firm i at time t; $Dum1_i$ is a year dummy variable coded 1 if firm i issues convertible bonds in year t, zero otherwise; $Dum2_i$ is a year dummy variable coded 1 if firm i issues convertible bonds last year, zero otherwise; $SIZE_{it}$ is natural logarithm of total assets for firm i in year t; LEV_{it} is ratio of total debts to total assets for firm i in year t; CFO_{it} is operating cash flows divided by total assets for firm i in year t; $ABSTA_{it}$ is the absolute value of total accruals scaled by total assets for firm i in year t; DCA_{it-1} is discretionary current accruals for firm i at time $t-1$. $T-1$, T and $T+1$ represent the last year before issuing convertible bonds, issuing convertible bonds year and the first year after issuing convertible bonds, respectively; *, **, and *** indicate significance at 10, 5 and 1 percent levels, respectively; $n = 423$

$$DCA_{it} = \beta_0 + \beta_1 Dum_i + \beta_2 SIZE_{it} + \beta_3 LEV_{it} + \beta_4 CFO_{it} + \beta_5 ABSTA_{it} + \beta_6 DCA_{it-1} + \varepsilon_{it}$$

		Domestic convertible bonds vs. overseas convertible bonds			
	Predicted signs	Coefficients	*t*-stat.	*p*-value	VIF
Intercept		0.138	2.632	0.009**	
Dum_i	−	−0.004	−0.389	0.698	1.337
$SIZE_{it}$	−	−0.013	−1.675	0.094*	1.330
LEV_{it}	?	−0.055	−1.619	0.106	1.138
CFO_{it}	−	−0.122	−3.141	0.002**	1.201
$ABSTA_{it}$	+	0.251	5.204	0.000**	1.092
DCA_{it-1}	−	−0.093	−3.513	0.000**	1.018
F-stat.			10.646	0.000**	
Adjusted R^2			0.038		

Notes: DCA_{it} is discretionary current accruals for firm i at time t; Dum_i is a dummy variable coded 1 if firm i issues overseas convertible bonds, 0 otherwise; $SIZE_{it}$ is natural logarithm of total assets for firm i in year t; LEV_{it} is ratio of total debts to total assets for firm i in year t; CFO_{it} is operating cash flows divided by total assets for firm i in year t; $ABSTA_{it}$ is the absolute value of total accruals scaled by total assets for firm i in year t; DCA_{it-1} is discretionary current accruals for firm i at time $t-1$; * and ** indicate significance at 10 and 1 percent levels, respectively; the sample includes 825 firms which issue domestic convertible bonds and 444 firms which issue overseas convertible bonds

Table VIII.
Regression analysis results of discretionary current accruals on overseas convertible bonds

significantly negative for specification 3B ($\beta = -0.022$, $p < 0.10$), suggesting that DCA declines in the first year after convertible bonds are redeemed.

To sum up, the above evidence shows that DCA is higher in the year firms redeem convertible bonds than in the first year after redeeming convertible bonds. That is, the magnitude of earnings management after redeeming convertible bonds is lower. Nevertheless, DCA is not higher in the year that firms redeem convertible bonds than in the year previous to the redeeming of convertible bonds. Therefore, *H3* is not supported. However, this may be because the sample size is relatively small for testing *H3*.

4.5 Sensitivity analysis

As mentioned in the earlier section, sample compositions in this paper suggest that there is a growing tendency for firms to issue convertible bonds. In order to capture the possible time effect on our empirical results, we included a year dummy variable in regressions (5) and (6). Our empirical results show that the coefficient of the time indicator is insignificant and signs and significances for other independent variables are similar to those in Tables VI-IX. Consequently, the results are unaffected by including a year dummy.

As shown in Panel B of Table II, the majority of our sample belongs to the electronics industry. To control the possible industry effect on our results, an additional industry dummy variable is included in regression equations (5) and (6). In untabulated results, the estimated coefficient on the year dummy variable is still significant in the expected direction, while the estimated coefficient on the industry dummy variable is insignificant. Therefore, this evidence suggests that our empirical results are not influenced by the industry effect.

Table IX. Regression analysis results of overseas discretionary current accruals on convertible bonds (Enron scandal)

$$DCA_{it} = \beta_0 + \beta_1 Dum_i + \beta_2 SIZE_{it} + \beta_3 LEV_{it} + \beta_4 CFO_{it} + \beta_5 ABSTA_{it} + \beta_6 DCA_{it-1} + \varepsilon_{it}$$

		Pre-Enron (1990-2001, 2A) ($n = 434$)				Post-Enron (2002-2005, 2B) ($n = 834$)			
	Predicted signs	Coefficients	t-stat.	p-value	VIF	Coefficients	t-stat.	p-value	VIF
Intercept		0.155	1.471	0.142		0.034	0.544	0.586	
Dum_i	–	0.020	1.420	0.156	1.319	−0.024	−2.101	0.036*	1.368
$SIZE_{it}$	–	−0.011	−0.669	0.504	1.353	0.003	0.314	0.753	1.371
LEV_{it}	?	−0.170	−2.787	0.006**	1.190	−0.026	−0.633	0.527	1.175
CFO_{it}	–	−0.145	−2.297	0.022*	1.261	−0.106	−2.182	0.029*	1.190
$ABSTA_{it}$	+	0.312	3.834	0.000**	1.133	0.186	3.204	0.001**	1.066
DCA_{it-1}	–	−0.159	−3.598	0.000**	1.032	−0.076	−2.185	0.029*	1.016
F-stat.			6.640	0.000**			4.845	0.000**	
Adjusted R^2			0.079				0.027		

Notes: DCA_{it} is discretionary current accruals for firm i at time t; Dum_{it} is a dummy variable coded 1 if firm i issues overseas convertible bonds, 0 otherwise; $SIZE_{it}$ is natural logarithm of total assets for firm i in year t; LEV_{it} is ratio of total debts to total assets for firm i in year t; CFO_{it} is operating cash flows divided by total assets for firm i in year t; $ABSTA_{it}$ is the absolute value of total accruals scaled by total assets for firm i in year t; DCA_{it-1} is discretionary current accruals for firm i at time $t-1$; * and ** indicate significance at 5 and 1 percent levels, respectively

Table X. Regression analysis results of earnings management around redeeming convertible bonds

$$DCA_{it} = \beta_0 + \beta_1 DUM3(4)_i + \beta_2 SIZE_{it} + \beta_3 LEV_{it} + \beta_4 CFO_{it} + \beta_5 ABSTA_{it} + \beta_6 DCA_{it-1} + \varepsilon_{it}$$

		T′ −1 VS T′ (3A)				T′ VS T′ +1 (3B)				T′ −1 VS T′ +1 (3C)			
	Predicted signs	Coefficients	*t*-stat.	*p*-value	VIF	Coefficients	*t*-stat.	*p*-value	VIF	Coefficients	*t*-stat.	*p*-value	VIF
Intercept		−0.134	−1.565	0.120		0.028	0.300	0.765		−0.009	−0.097	0.923	
$Dum3_i$	+	0.004	0.401	0.689	1.020								
$Dum4_i$	−					−0.022	−1.936	0.055*	1.015	−0.017	−1.515	0.132	1.009
$SIZE_{it}$	−	0.024	2.091	0.038**	1.075	0.006	0.506	0.614	1.109	0.010	0.817	0.416	1.092
LEV_{it}	?	−0.122	−2.889	0.004***	1.216	−0.156	−3.547	0.001***	1.210	−0.160	−3.700	0.000***	1.166
CFO_{it}	−	−0.228	−4.183	0.000***	1.167	−0.157	−2.179	0.031**	1.239	−0.190	−2.969	0.004***	1.098
$ABSTA_{it}$	+	0.218	3.480	0.001***	1.204	0.020	0.243	0.808	1.225	0.093	1.365	0.175	1.198
DCA_{it-1}	−	0.167	2.376	0.019**	1.086	0.161	1.986	0.049**	1.192	0.051	0.647	0.519	1.129
F-stat.			6.263	0.000***			4.417	0.000***			3.840	0.001***	
Adjusted R^2				0.175			0.121					0.103	

Notes: DCA_{it} is discretionary current accruals for firm i at time t; $Dum3_i$ is a year dummy variable coded 1 if firm i redeems convertible bonds in year t, zero otherwise; $Dum4_i$ is a year dummy variable coded 1 if firm i redeems convertible bonds last year, zero otherwise; $SIZE_{it}$ is natural logarithm of total assets for firm i in year t; LEV_{it} is the ratio of total debts to total assets for firm i in year t; CFO_{it} is operating cash flows divided by total assets for firm i in year t; $ABSTA_{it}$ is the absolute value of total accruals scaled by total assets for firm i in year t; DCA_{it-1} is discretionary current accruals for firm i at time $t-1$. T' −1, T' and T' +1 represent the last year before redeeming convertible bonds, redeeming convertible bonds year and the first year after redeeming convertible bonds, respectively; *, **, and *** indicate significance at 10, 5 and 1 percent levels, respectively; $n = 75$

Prior literature suggests that the processes of seasoned equity offerings (Rangan, 1998; Teoh *et al.*, 1998a) and initial public offerings (Teoh *et al.*, 1998b) are susceptible to earnings management. To this point, we reran our regression equations (5) and (6) after excluding firms which conduct seasoned equity offerings or initial public offerings in the period when convertible bonds are issued. Empirical conclusions on *H1* and *H2* in the previous section still hold.

Teoh and Wong (1993) show that auditors' reputations lend credibility to the earnings report that they audit. They also provide evidence that auditor credibility increases with auditor size. Therefore, we re-estimated regressions (5) and (6) after including a related control variable. More specifically, we added Big 4 auditing firms as the surrogate of audit quality to control the possible effect. The conclusions remain essentially the same as those presented in Tables VI-IX.

5. Conclusion

This study investigated whether firms are engaged in earnings management when issuing convertible bonds. Also, we tested if firms issuing domestic convertible bonds perform a higher level of earnings management than ones issuing convertible bonds abroad. Finally, we examined whether firms are engaged in earnings management in the year when convertible bonds are redeemed. The sample consists of firms listed on TSE and OTC from 1990 through 2004. Our results indicate the following findings and implications.

The empirical results demonstrate that convertible bonds issuers generally conduct upward earnings management in the issuing year. That is, convertible bonds issuers have incentives to engage in earnings management in order to promote their convertible bonds and to reduce the issuing costs. Furthermore, the level of earnings management is higher in the year following the issue than in the year before the issue. This may be because firms attempt to influence creditors' willingness to convert their bonds into stocks through earnings management.

There is no difference in earnings management between firms that issued convertible bonds domestically and firms that issued convertible bonds abroad. After splitting the sample into two sub-samples, we found that there is no difference in the level of earnings management, whether firms issued convertible bonds abroad or not in the pre-Enron period. However, the level of earnings management is lower for firms that issued overseas convertible bonds in the post-Enron period.

The level of earnings management is higher in the year convertible bonds are redeemed than in the year after redeeming. The level of earnings management is not different between the year in which firms redeem convertible bonds and the year before redeeming. Thus, we have no evidence as to whether firms conducted upward earnings management in the redeeming year.

This study has the following limitations. First, subject to the sample period and the way used to categorize industries, we excluded some industries (e.g. paper, automobile, and glass and ceramic industries) that have a small sample size or their nature is too specialized to combine with other industries. Second, the period we used to test whether the magnitude of earnings management in the redeeming year is lower may be too short (1990-1998). Thus, because the sample size for this testing may be too small and the majority of the convertible bonds are still outstanding, the research findings must be interpreted with caution. Third, because the disclosure about the countries/ markets in which the overseas convertible bonds are issued is not required, we cannot

provide an in-depth analysis on this respect. Future research may further investigate this when the information is available.

The study has found that companies may conduct earnings management in order to issue convertible bonds to successfully raise capital. However, if operating performance of the company after the bonds are issued does not increase as expected, more earnings management may bring negative evaluations of the company by investors (Lundholm, 1999). Therefore, we suggest that companies enhance their level of information disclosure to reduce the level of earnings smoothing when issuing convertible bonds to raise the capital needed.

Notes

1. The SFI in Taiwan is the counterpart of the SEC in the USA.
2. The *TEJ* in Taiwan is equivalent to the Compustat in the USA.
3. Based on Teoh *et al.* (1998a), if a firm has multiple issues, we included only the earliest issue.
4. Since convertible bonds have a longer outstanding period and most of the bonds issued after 1998 are still outstanding currently, the sample used to test *H3* includes only the convertible bonds that were issued between 1990 and 1998.
5. Gujarati (1995) suggests that multicollinearity is unlikely to be problematic if the variance inflation factor is below 10.

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Appendix

Since this paper uses a time-series approach to examine the changes of DCA between two years ($T-1$ vs T and T vs. $T+1$), it is interesting to see the relations among DCA, CFO, net income (NI) and RET (natural logarithm of return of stock). In this section, we investigate whether these variables vary systematically over the time. Figure A1 plots temporal changes in DCA, CFO, NI

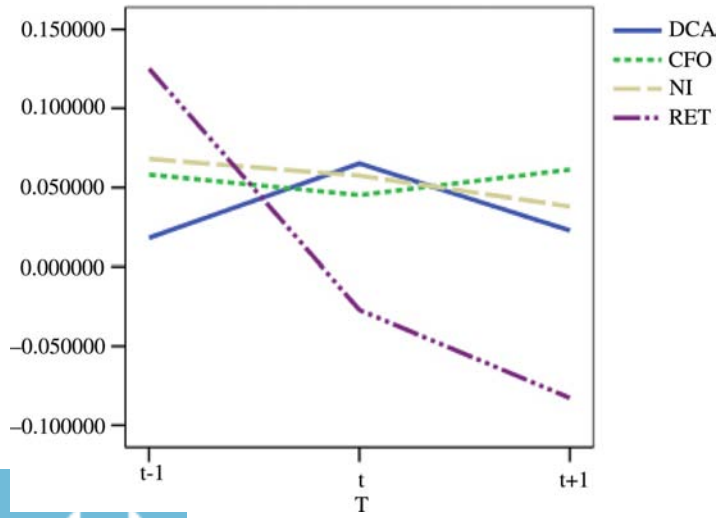

Figure A1.
Graph of DCA, CFO, NI and RET around issuing convertible bonds

and RET around issuing convertible bonds. It reveals that the tendency is consistent with the results in Table VI, which demonstrates a shift when firms issue convertible bonds. In addition, Figure A2 presents the temporal changes in these variables around redeeming convertible bonds. The results are also consistent with those in Table X.

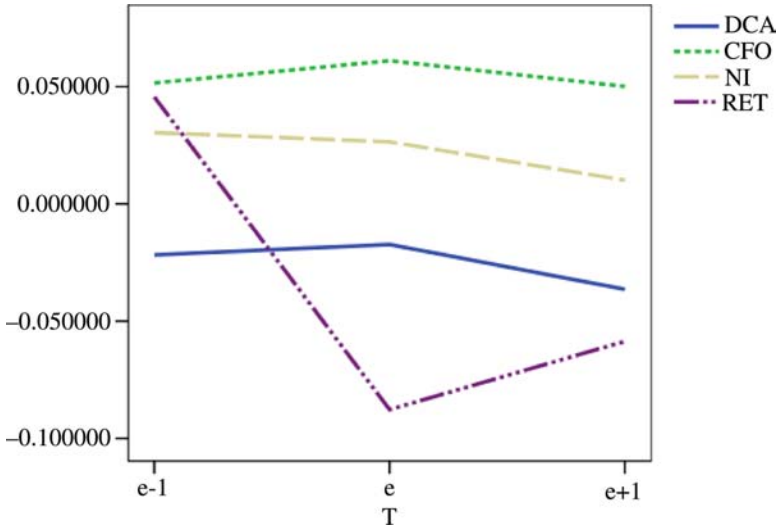

Figure A2.
Graph of DCA, CFO, NI and RET around redeeming convertible bonds

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