The Information Asymmetry for the Influence of Earnings Management on the Long-run Performance: Evidence from the Issuance of Convertible Debt

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Abstract

We examine the role of information asymmetry in explaining the relation between earnings management and long-run poor performance. We use a sample of convertible debt offerings from 1989 to 2000. In high degree of information asymmetry environment, we find that firms with aggressive earnings manipulation have more unfavorably than long-run stock and operating performance of those with conservative earnings manipulation. However, in low degree of information asymmetry environment, the long-run stock and operating performances are indifferent between firm with aggressive and conservative earnings management. Our finings hold even after controlling for other potentially influential variables. Our evidence supports the notion that the information asymmetry plays an important role in assessing the relation between the long-run performance and earnings manipulation. Our findings enhance the understanding of the impact of information asymmetry on the earnings management to concern with long-run poor performance in general.

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Any remaining errors are the authors'.

Ⅰ. Introduction

The general use of accounting information by investors and financial analysts to value firm's stock creates an incentive for earnings management in an attempt to influence short-run stock price (Dye, 1988 and Trueman and Titman, 1988). Prior studies have shown that managers tend to overstate earnings in periods prior to equity-offerings, such as initial public offers (Aharony, Lin, and Loeb, 1993; Teoh, Welch, and Wong, 1998a; and Larry, Malatesta, and Sefcik, 2001 and 2004); seasoned equity offers (Teoh, Welch, and Wong, 1998b; Rangan, 1998; and Shivakumar, 2000); and stock-financed acquisitions (Erickson and Wang, 1998 and Louis, 2004). Furthermore, the behavior of earnings manipulate will show its slip over time, the stock price and accounting performance will revise down in the following years (Sunder, 1997). Teoh, Welch, and Wong (1998a and 1998b), Rangan (1998), Louis (2004) and others, find that the degree of earnings management is significantly associated with poor post-issue long-run stock performance. Sloan (1996), Xie (2001) and Chan, et al. (2006) also document that firm with greater earnings management experience lower subsequent abnormal stock returns.

The literature has suggested that the effect of earnings management is related with a firm's information characteristics. Because shareholders lack sufficient resources, incentives or access to relevant information, it is often difficult for them to have an effective monitoring on manager's actions (Schipper, 1989 and Warfield, Wild, and Wild, 1995). Analytical models have demonstrated that the existence of information asymmetry between firm management and shareholders is a necessary condition for the practice of earnings management (Dye, 1988, Trueman and Titman, 1988, and Chaney and Lewis, 1995). In addition, Richardson (2000) present some empirical evidence that the greater the information asymmetry between management

and shareholders, the more likely the firms are to manage accruals and earnings. Besides, Bushee (1998) finds that firms with greater institutional ownership are less likely to manipulate earnings by cutting research and development expenditures because the monitoring by institutional investors reduce the effectiveness of earnings management. Finally, Frankel and Li (2004) find that the profit of insider trading is strongly related with characteristics of firms' information environment. Insiders have larger gains when the degree of information asymmetry is greater. Thus, the effectiveness of earnings management to mislead investors may depend on the information environment of the firm.

In this study we investigate how information environment of a firm influence the relationship of earnings management and stock performance. We argue that the relationship between earnings management and long-run stock performance is dependent upon the information environment. Managers of firms with greater information asymmetry are more likely to cheat investors and experience subsequent inferior stock performance of firms when the over-evaluation of the firm's earnings in event year will be inversed. In contrast, for firms in more transparently informational environment, earnings management is less likely to mislead investors by simply providing better accounting numbers. That is, investors are more likely to "see-through" the manipulated reported earnings, and thus the relationship of earnings management and subsequent stock performance should be much weaker. This study contributes to the literature in the information environment consideration. Most of prior studies only consider the effect of earnings management and the following stock performance. And some of these studies find the earnings management inversely related to the post-issue performance. In our argument, to the extent that transparently informational environment convey more perspicacity to

financial market, we expect that firm's post-issue performance unrelated to earnings management by firms with better information environment. To the best of our knowledge, the effect of information environment has never been discussed in this line of research.

We use convertible debt offerings as the event to discuss the importance of information environment. We believe the hybrid characteristics of convertible debts provide incentives for earnings management. Previous research shows that earnings management may benefit bond-issuing firms by reducing the cost of capital, because bond rating agencies and credit risk models appear to rely heavily on accounting information. Fisher (1959) demonstrates that bond default risk rate is associated with accounting and other financial information. Kaplan and Urwitz (1979) and Ziebart and Reiter (1992) document the accounting values in assets and profitability have important impacts on bond ratings and yields. Therefore, by affecting the component of discretionary accruals in reported earnings, firms may obtain better deals in yield-to-maturity when they issue convertible debts.

Furthermore, convertible debt is a compound financial instrument in that it has both debt and equity components. Stein (1992) argues that convertible bond issuing is a form of backdoor equity financing. Prior research also finds the convertible debt allows "would-be" equity issuers to raise external capital in situations where heightened investor uncertainty about future operating performance closes the window of opportunity for a common equity offer (Lewis, Rogalski, and Seward, 2001). The "window of opportunity" is essentially an asymmetric information argument. The claims that managers tend to issue equity or equity-linked debt (like convertible debt) when equity at the time of issuance is overvalued. Therefore, we presume that firms may also gain from earnings management from the equity

component of convertibles.

This study investigates information environment, earnings management and the long-run performance with a sample of convertible debt offerings from 1989 to 2000. Consistent with prior research, the results show that convertible debt issuing firms, on average, experience poor post-issue long-run performance (Dichev and Piotroski, 1999, and Speiss and Affleck-Graves, 1999). In addition, we find a strong evidence of earning management associated with convertible debt issues. The amount of discretionary accruals increases surround the convertibles issuing years. When we test whether earnings management is systematically related with post-issue stock performance, the evidence suggests that firms with aggressive earnings management exhibit inferior stock performance. More importantly, we find strong evidence that the negative relationship between earnings management and post-issue stock performance is dependent upon the information environment of the issuing firm. Under various measures of information asymmetry, the results consistently show that the negative relationship between earnings management and post-issue performance is mainly driven by those firms with greater information asymmetry. For firms in a more transparently informational environment, the relationship of earnings management and post performance is weak and insignificant. This conclusion remains when we control for other important determinants of stock performance in the regression analysis. The overall results in our study suggest that the role of information asymmetry is important in assessing the relationship between earnings management and log-run poor performance. Therefore, our research enhances the understanding of the impact of information asymmetry on the earnings management concern with long-run poor performance in general.

The remainder of the paper is organized as follows. Section Ⅱ describes the

sample and presents summary statistics. Section III presents the research methodologies. Section IV examines the relation between earnings management and long-run performance and the how does the information asymmetry to affect this relation. Section V concludes.

II. Data and Sample Selection

The initial sample of convertible debt issuing was collected from Securities Data Company's (SDC) online database over the period from 1989 through 2000. Our samples were eliminated in the following situations: (1) the convertible debt were not pure debt issues such as if other classes of security were jointly issued was involved. (2) The company must have been listed on the Center for Research in Securities Prices (CRSP) daily and monthly tape at the time of the issuing. (3) Companies have a non-negative book-to-market ratio available on the COMPUSTAT files for the year-end prior to the convertible debt issuing. (4) We excluded convertible debt offerings by financial services firms (two digits SIC is 60-69) because the nature of the accounting information of these firms is very different from that of industrial firms. (5) We also delete the offering by utility firms (two digits SIC is 49). (6) For a firm that made several debt issues in the three years, we only included the first issue alone in order to reduce problems of cross-sectional dependence in the empirical analysis.

[Insert Table 1 Here]

Table 1 summarizes the sample distribution of issuing convertible debt by industry groups and issuing year. Panel A in Table 1, shows our final sample, consisting of 205 offerings of convertible debt. There are more offerings for

convertible debt in manufacturing industry (70 observations) and services industry (40 observations). Panel B indicates that in 1993 (34 observations), 1989 (31 observations), 1992 (27 observations), and 1991 (21 observations) there were relatively large numbers of convertible debt events. There are fewer offerings for convertible debt during 1998 and 1999. The sample size could vary throughout the tests in our study, primarily because of data items missing from COMPUSTAT, CRSP or I/B/E/S.

We present summary statistics of each variable in Table 2. Panel A presents the measures of the information asymmetry of the firms and the extent of earnings management. We will detail these measures in following section. The discretionary current accrual for the average (median) issuer in our sample is 0.04 (0.02). In Panel B, the adjusted matching firm's long-run stock and operating performance on average are negative. Panel C presents the summary statistics of firm characteristics. The mean (median) issuing size is $145.39 ($100) million. The mean (median) firm size, as measured by the market value of common equity, is $1543.19 ($397.37) million. The mean (median) relative issuing size is 31.65% (20.99%). The mean and median book value of common equity is $462.54 and $140.35 million. These statistics imply that the convertible debt issuers almost are small size in the stock market. The mean and median change of sales is 36.95% and 18.30%, shows that convertible debt issuing firms have 37% sales growth rate at prior issuing year. The mean (median) book-to-market ratio is 53.06% (41.98%) for the convertible debt issuers.

[Insert Table 2 Here]

III. Variable Construction

A. Long-run Performance

Different methodologies may produce nontrivial differences in estimating the long-run abnormal returns (Mitchell and Stafford, 1998). Recent methodological studies of calculating long-run abnormal returns do not show coincidence to the best method issue. For example, Fama (1998) suggested the use of calendar abnormal returns, because they have better statistical properties and allow for solving the cross-sectional dependence problems in sample observations. However, Barber and Lyon (1997) favor the use of buy-and-hold abnormal returns, because they reflect compounded calculated long-run returns and can measure investor experience. To be fair, both methodologies have their own advantages and shortcomings and can be regarded as being complementary rather than competing for calculating the long-run abnormal returns. We, thus, classify the research methodologies that we will apply to measure long-run performance after convertible debt offerings into two basic approaches: (1) the buy-and-hold abnormal return method and (2) the calendar time abnormal return method. We describe our methodologies in more detail below.

A.1 Buy-and-Hold Abnormal Returns Method

At first we utilize the methodology of Barber and Lyon (1997) to estimate the long-run buy-and-hold abnormal returns. The buy-and-hold abnormal return (BHAR) for stock *i* over the period from time *t* to time *T* is defined as:

$$BHR_{i,tT} = \prod_{t}^{T}(1 + R_{it}) \quad \text{.....(1)}$$

$$BHR_{ctrl,tT} = \prod_{t}^{T}(1 + R_{ctrl,t}) \quad \text{.....(2)}$$

$$BHAR_{i,tT} = BHR_{i,tT} - BHR_{ctrl,tT} \quad \text{.....(3)}$$

where $BHR_{i,tT}$ is the buy-and-hold return of the sample firm and $BHR_{ctrl,tT}$ is the buy-and-hold return of the matching firm over the same period. Barber and Lyon (1997) completely discussed the way to construct benching portfolios that will be free of new listing and re-balancing biases and concluded that the matched matching firm approach leads to unbiased test statistics. The matched matching firm approach chooses the matching firm under specified firm characteristics: (1) a exchange market, an industry (the same SIC code), and size-matched sample and (2) a exchange market, size, and book-to-market ratio matched sample. We, then, matched the sample firm to a matching firm with the closest or most similar characteristics to the sample firm. The computation of the buy-and-hold abnormal returns begins the day after the annual financial statement announcement in the issuing year and continues through three-year period (756 days) following the announcement or until the sample firm is de-listed, whichever is sooner. We truncate the sample due to the suggestions Barber and Lyon (1997) that long-run result are generally robust to truncating or filling in the missing returns after de-listing. After $BHAR_{i,tT}$ is obtained for each of the *n* firms in the sample, the cross-sectional average buy-and-hold abnormal return ($\overline{BHAR}_{t:T}$) is calculated using either the equally weighted case as follows:

$$\overline{BHAR}_{t:T} = \frac{1}{n}\sum_{i=1}^{n} BHAR_{i,tT} \quad \text{.....(4)}$$

To assess the statistical significance, we employ a conventional *t*-statistic, a parametric long run test, as follows:

$$t = \frac{\overline{BHAR}_{t,T}}{\sigma_{BHAR_{t,T}} / \sqrt{n}} \quad \text{.....(5)}$$

where $\overline{BHAR}_{t:T}$ is sample mean and $\sigma_{BHAR_{t,T}}$ is the cross-sectional sample standard deviation of the buy-and-hold abnormal returns. Term *n* is the number of sample firms.

A.2 Calendar Time Abnormal Return Model

The calendar time abnormal return method was first used by Jaffe (1974) and Mandelker (1974) and strongly advocated by Fama (1998). Under the procedure of the calendar time abnormal return method, the cross-sectional correlation of the sample firm's returns can be automatically accounted. For completeness, we use two variations of the calendar-time portfolio method to measure the long-run performance following convertible debt issuing: the Fama and French (1993) three-factor model and Carhart (1997) four-factor model.

A.2.1 Fama and French Three-factor Model

For each calendar month in our sample period, we form separate portfolios of sample firms that have announced convertible debt issuing in the previous three-year periods and calculate the monthly returns for both equally weighted and value-weighted portfolios. In order to avoid statistical problems caused by overlapping returns, no firm may be include more than once in the portfolio during any given three-year window. We then use the Fama and French (1993) three-factor model as follows:

$$R_{pt} - R_{ft} = \alpha_p + \beta_m (R_{mt} - R_{ft}) + \beta_s SMB_t + \beta_h HML_t + \varepsilon_t \text{ …….(6)}$$

where R_{pt} is the portfolio month return of sample firms in month *t* (either equally weighted or value-weighted), R_{ft} is the one-month treasury bill interest rate,

($R_{mt} - R_{ft}$) is the excess return on the market portfolio, SMB_t is the difference in the returns between the value-weighted portfolios of small stocks and big stocks, and HML_t is the difference in returns between the value-weighted portfolios of high book-to-market stocks and low book-to-market stocks.

In three-factor model, α_p measures the mean monthly abnormal return, which is zero under the null hypothesis for no long-run abnormal returns. However, as shown by Fama and French (1993 and 1998), Lyon, Barber, and Tsai (1999), Lee and Swaminathan (2000), Mitchell and Stafford (2000) as well as Boehme and Sorescu (2002), the three-factor model can not completely explain cross-sectional variations in the momentum-sorted portfolio returns (Fama and French, 1998). In other words, it is important in the current study to control the momentum effect. Thus we utilize the Carhart (1997) four-factor model, which includes a price momentum factor, to control the momentum biases, and to estimate the intercept α_p.

A.2.2 Carhart Four-factor Model

The Carhart four-factor model uses the Fama and French's (1993) three-factor model plus an additional factor to capture one-year momentum anomalies. The model is presented as follows:

$$R_{pt} - R_{ft} = \alpha_p + \beta_m (R_{mt} - R_{ft}) + \beta_s SMB_t + \beta_h HML_t + \beta_u UMD_t + \varepsilon_t \text{ ……..(7)}$$

where R_{pt} is the portfolio month return of sample firms in month *t* (either equally weighted or value-weighted), R_{ft} is the one-month treasury bill interest rate, ($R_{mt} - R_{ft}$) is the excess return on the market portfolio, SMB_t is the difference in the returns between the value-weighted portfolios of small stocks and big stocks,

and HML_t is the difference in returns between the value-weighted portfolios of high book-to-market stocks and low book-to-market stocks. Term UMD_t is the price momentum factor as defined in Carhart (1997), the difference between an equally weighted portfolio return of stocks with the lowest 30 percent returns in months $t-12$ to $t-2$. The portfolios include all NYSE, Amex, and NASDAQ stocks.

A.3 Operating Performance

We examine the operating performance of our sample firms over a three-year period (1, 2, and 3) after the convertible debt offer date, sum of the unadjusted and matching firm-adjusted year-on-year changes. Following Rangan (1998) to measure the operating performance we compute the following ratios: (1) the net income (NI) divided by lagged total assets. (2) The earnings before interest and taxes (EBIT) scaled by lagged total assets. (3) The return on assets (ROA) is the ratio of net income before extraordinary items to lagged total assets. We calculate and sum the changes in operating performance from years 1 to 3.

B. Information Asymmetry

In this study, we use for five proxy variables that could measure the extent of information asymmetry. The proxy variables include (1) informativeness of financial statements, (2) analyst following, (3) residual standard deviation, (4) announcement reaction, and (5) analysts' forecast error. Data on the information asymmetry variables are obtained from the COMPUSTAT, CRSP and I/B/E/S. The summary statistics for these variables are shown in Table 2.

Informativeness of financial statements is estimated by an adjusted-R^2 from a firm-specific time-series regression:

$$P_{it} = a + b_1 EPS_{it} + b_2 BV_{it} + e_{it} \text{ .....(8)}$$

where P_{it} is the price per share of firm *i* there months after fiscal year end *t*, EPS_{it} is the earnings per share of firm *i* at the fiscal year end *t*, BV_{it} is the book value per share of firm *i* at the fiscal year end *t* (as Frankel and Li, 2004; Francis and Schipper, 1999; and Ely and Waymire, 1999). The greater adjusted-R^2 implies higher value relevance of financial statements. And then we can expect a negative relation between the value relevance of financial statements and information asymmetry. This variable is set to missing if fewer than 5 yearly observations are available form 1960 to 1999. As shown in Table 2, the average and median informativeness of financial statements are 25% and 24%.

Analyst following is defined as the number of analysts following the firm in the prior fiscal year (as Frankel and Li, 2004 and Bhushan, 1989). We measured analyst following using the I/B/E/S summary Tape. For each firm-calendar year we use the maximum number of analysts making one-year-ahead forecasts. We code firms missing from the I/B/E/S database as having zero analysts. Analysts are significant roles as intermediaries between managers and investors. More analysts to follow with interest the firm will reduce information asymmetry between managers and investors. The distribution of the analyst following in year -1 is also presented in Table 2. The mean and median natural logarithm of analyst following is 1.63 and 1.95.

We follow Bhagat, Marr, and Thompson (1985), Blackwell, Marr, and Spivey (1990), and Krishnaswami and Subramaniam (1999), we adopt the residual volatility in daily stock returns as the proxy for information asymmetry. We measure this proxy variable as the dispersion in the market-adjusted daily stock returns in the year preceding the announcement of the convertible debt offering. If the investors

and the firm's managers are equally well-informed about the economy-wide factors influencing the firm's value, then the residual volatility in the firm's stock returns captures the information asymmetry between the investors and the managers about firm-specific information. We expect that firms with higher information asymmetry about their value to have higher residual volatility in their stock returns. The mean and median residual volatility all are 0.03.

The fourth measure of information asymmetry is the announcement reaction (as Krishnaswami and Subramaniam, 1999), which is measured as the volatility in abnormal returns around earnings announcements. We evaluate this proxy variable as the standard deviation of the three-day abnormal returns is around the announcement of quarterly financial statement. All of quarterly earnings announcement dates are collected from COMPUSTAT. We adopt the CRSP value-weighted index as the market-adjusted abnormal returns around the announcement dates. A stronger reaction by the market around an earnings announcement suggests that information asymmetry is higher for these firms (Krishnaswami and Subramaniam, 1999). The mean and median of the return volatility of announcement reaction is 3.62 and 0.06.

Finally, we follow Elton, Gruber, and Gultekin (1984), Christie (1987), and Krishnaswami and Subramaniam (1999), we measure the analyst forecast error as the ratio of the absolute difference between the analyst forecast earnings per share and the actual earnings per share to the price per shares at the last month of fiscal year -1. Firms with higher level of information asymmetry between the managers and the outside investor about their value are expected to have higher forecast errors. The average of analyst forecast error is 0.02.

C. Earnings Management

Differences between revenues recognized and cash received or expenses recognized and cash expenditures create accruals or deferrals. Accounting earnings consist of cash flow from operations and accounting adjustments create accruals. Earnings management is most likely to occur on the accruals component rather than on the cash flow component of earnings. If earnings management is employed to increase earnings, the increase can be accomplished through early recognized revenues or delay recognized expenses. With the managerial flexibility in accrual system of accounting, firms have chances for earnings management.

However, not all accruals items are equally subject to manipulation or management. Long-term accrual items, which are accounting adjustments to long-term assets and liabilities, are more difficult to manage or adjust since accounting choices for long-term assets remain consistent over several years. But, short-term accruals, which are accounting adjustments to short term assets and liabilities, such as the change in accounts receivable, are easier to manipulate since accounting choices for short-term assets. We follow the methodology of Teoh, Welch, and Wong (1998a and 1998b) to measure the expected current accruals from a modify Jones (1991) model. Expected accruals, called nondiscretionary accruals by Teoh, Welch, and Wong (1998a and 1998b), are evaluate from a cross-sectional regression of accruals in a given year on the change in sales using an estimation sample that includes all firms with same two-digit SIC code as the convertible debt issuer, but delete the issuer and other convertible debt issuers. To ensure that the estimated coefficients created from the regression are not biased, the number of the two-digit SIC code peers is required to be at least 10. To reduce heteroskedasticity in the data, we scaled all variables in the regression by total assets at the beginning of the year. We run the following cross-sectional regression using the estimation coefficient:

$$\frac{CA_{j,t}}{TA_{j,t-1}} = \alpha_0\left(\frac{1}{TA_{j,t-1}}\right) + \alpha_1\left(\frac{\Delta Sales_{j,t}}{TA_{j,t-1}}\right) + \varepsilon_{j,t} \text{ ……..(9)}$$

where *CA* is current accruals, *TA* is total assets, $\Delta Sales$ is the change in sales, *j* firm is in the same two-digit SIC codes as the issuer, and *t* indicate year *t*. Expected (or Nondiscretionary) current accruals for convertible debt issuer *i*, is estimated as:

$$NDCA_{i,t} = \hat{\alpha}_0\left(\frac{1}{TA_{i,t-1}}\right) + \hat{\alpha}_1\left(\frac{\Delta Sales_{i,t} - \Delta TR_{i,t}}{TA_{i,t-1}}\right) \text{…….(10)}$$

where $\hat{\alpha}_0$ is the intercept estimator and $\hat{\alpha}_1$ is the slope estimator for the issuer *i*, and $\Delta TR_{i,t}$ is the change in trade receivables for year *t* for issuer *i*. To account for the possibility of credit sales manipulation, we subtract the increase in accounts receivable from sales growth.

Discretionary current accruals (DCA) are calculated as:

$$DCA_{i,t} = \frac{CA_{i,t}}{TA_{i,t-1}} - NDCA_{i,t} \text{ ……..(11)}$$

For long-term accruals, with a convertible debt issuing we first estimate nondiscretionary and discretionary accruals by running the following regression in a similar method. Since long-term accruals are affected by the amount of long-term assets, we include property, plant, and equipment into model (9) as an additional independent variable.

$$\frac{TAC_{j,t}}{TA_{j,t-1}} = \beta_0\left(\frac{1}{TA_{j,t-1}}\right) + \beta_1\left(\frac{\Delta Sales_{j,t}}{TA_{j,t-1}}\right) + \beta_2\left(\frac{PPE_{j,t}}{TA_{j,t-1}}\right) + \varepsilon_{j,t} \text{ ……..(12)}$$

where $TAC_{j,t}$ is total accrual, and $PPE_{j,t}$ is gross, property, plant, and equipment for in year *t* for firm *j*.

The nondiscretionary total accruals scaled by assets (NDTAC) are estimated as:

$$NDTAC_{i,t} = \hat{\beta}_0\left(\frac{1}{TA_{i,t-1}}\right) + \hat{\beta}_1\left(\frac{\Delta Sales_{i,t} - \Delta TR_{i,t}}{TA_{i,t-1}}\right) + \hat{\beta}_2\left(\frac{PPE_{i,t}}{TA_{i,t-1}}\right) \text{…….(13)}$$

Where $\hat{\beta}_0$ is the intercept estimator and $\hat{\beta}_1$ and $\hat{\beta}_2$ are the slope estimators for the convertible debt issuer *i* in year *t*. Therefore, the discretionary total accruals scaled by assets (DTAC) are represented by the residuals:

$$DTAC_{i,t} = \frac{TAC_{i,t}}{TA_{i,t-1}} - NDTCA_{i,t} \text{ ……..(14)}$$

Total accruals are sum of current accruals and long-term accruals. The total accruals are decomposed into current and long-term components and evaluate them separately because firms have more discretion over current than over long-term accruals. Therefore, nondiscretionary long-term accruals scaled by assets (NDLA) will be the difference between nondiscretionary total accruals (NDTAC) and nondiscretionary current accruals (NDCA). Discretionary long-term accruals scaled by assets (DLA) will be the difference between discretionary total accruals (DTAC) and discretionary current accruals (DCA). Thus,

$$NDLA = NDTAC - NDCA \text{.....(15)}$$
$$DLA = DTAC - DCA \text{.....(16)}$$

We decompose accruals into four components (as Tech, Welch, and Wong, 1998a and 1998b): discretionary and nondiscretionary current accruals, and discretionary and nondiscretionary long-term accruals. Nondiscretionary accruals are the asset-scaled proxies for unmanaged accruals. Discretionary accruals are the asset-scaled proxies for managed earnings determined at the discretion of management. Table 3, Panel A, presents the time-series distribution from -3 year to 3

year at issue year. According to Panel A in Table 3, we present that the median of discretionary current accrual (DCA) decline over time from a significant positive 1.8 percent of beginning assets in the convertible debt issuing year to a level insignificantly different from zero by year 3, the median of discretionary long-term accrual (DLA) is 0.003, insignificantly, and the median of nondiscretionary current and long-term accruals are significantly from year -3 to year 3. And then discretionary current accruals (DCA) are the superior proxy for earnings management.

[Insert Table 3 Here]

In Panel B, We report that two accounting performance measures, net income and cash flow from operations as percentage of lagged total assets and adjusted industry effect. The time series patterns of industry-adjusted net income and cash flow from operations also hint at earnings management. The median net income is significantly increasingly positive from -3 year to 0 year and then declines monotonically to 0.007 in year 3, insignificantly. The cash flow from operations is poorly in the issuance year and monotonically improves through year 3. These patterns are consistent with managers advancing accruals to increase reported net income in the issuance period. Afterward, even though the median cash flow from operations actually improves every year, the decline in post-issue accruals causes a post-issuing decline in earnings. The results are consistent with Teoh, Wong, and Rao (1998), and Teoh, Welch, and Wong (1998a), who present that these patterns, are robust with respect to alternative earnings management and income performance measures.

In Table 4, we divide the convertible debt issuing firms into four subgroups based on the discretionary current accruals (DCA): firms competing in more conservative earnings management (Q1), firms competing in more aggressive

earnings management (Q4), firms competing in little conservative earnings management (Q2) and firms competing in small aggressive earnings management (Q3). We follow Teoh, Welch, and Wong (1998a) classification method by defining the Q1 group as the sample firms with DCA values less than first quartile (DCA≦ -0.036), the Q2 group as those with DCA values between first quartile and median (-0.036≦DCA≦0.018), the Q3 group as those with DCA values falling within median and third quartile (0.018≦DCA≦0.083), and the Q4 group as those with DCA values greater then third quartile (0.083≦DCA). The results show that standard deviation within the more aggressive group (Q4) and more conservative group (Q1) are (0.301 and 0.125) larger then within two middle groups. The overall sample standard deviation is 0.22.

[Insert Table 4 Here]

In firm characteristics, Table 4 shows that conservative quartiles (Q1 and Q2) include larger size than aggressive quartile (Q3 and Q4), even though the pattern is not order by the four quartiles. And Table 4 also presents that the more aggressive earnings management have smaller book to market ratio (0.346) and larger net income scaled by lagged assets (0.071). That means higher investment opportunity and larger return on assets firms have more possibility to manipulate earnings. However, there are not difference pattern between discretionary current accruals and earnings to price ratio.

Ⅳ. Empirical Results

In this section, we first investigate the relationship between convertible debt offerings' long-run stock performance and earnings manipulation. We then analyze subsamples stratified according to the degree of information asymmetry and

earnings management. The cross-section regression analyses and calendar time abnormal return model analyses are also studied in detail.

A. Long-run performance and earnings management

We employ buy-and-hold returns to examine the relationship between long-run performance and earnings management of convertible debt issuing. We start to compute return over the period first day after announcement date of the convertible debt offering's annual financial reports for the year 0. Buy-and-hold return over the period (1 to 756) is calculated by multiplied the daily returns over the respective periods. The results of the buy-and-hold returns are reported in Table 5.

[Insert Table 5 Here]

Table 5 gives the three-year raw returns of convertible debt issuing sample firms from 1989 to 2000, and the buy-and-hold abnormal returns, as measured by the four benchmarks approach: CRSP value-weighted market index, CRSP equal-weighted market index, industry and size matched matching firm, and size and book-to-market ratio matched matching firm. As shown, the average three-year buy-and-hold raw returns are significantly positive (13.55%). However, the average buy-and-hold adjusted returns are all significantly negative. The results are similar as Spiess and Affleck-Graves (1999), provide strong evidence that an offering of convertible debt is likely to be following by a period of under-performance.

We also divide the sample into the four subgroups based on the discretionary current accruals (DCA) and measure the buy-and-hold returns. The results in Table 5 show that the more aggressive earnings management (Q4) group experiences a negative average buy-and-hold raw return, a significantly negative average buy-and-hold adjusted return. At the same time, we also discover that the average

buy-and-hold raw return and buy-and-hold adjusted return of the more conservative earnings management (Q1) group is positive. Although, there are not visible systematic patterns between DCA quartiles and buy-and-hold return, more aggressive earnings management group (Q4) has relatively negative long-run performance.

In summary, the results in Table 5 generally support the previous papers' predictions for the role of earnings management in explaining the long-run performance of convertible debt offering. The buy-and-hold adjusted return for the issuing firms having more aggressive earnings management is significantly negative, while the buy-and-hold adjusted return is not significantly for those having more conservative earnings management. Furthermore, the long-run performance is significantly more unfavorable for the manipulating earnings firms than for no manipulating earnings firms.

B. Long-run performance, information asymmetry, and earnings management

B.1 Analysis of Subsamples Based on the Information Asymmetry and earnings management

We examine the buy-and-hold returns for the sample firms stratified into four portfolios that have similar degree of information asymmetry and earnings management. We use classification method by defining the high earnings management group as the sample firm with discretionary current accrual (DCA) greater than DCA median, and the low earnings management group as those with DCA less than DCA median. Simultaneously, we also use classification method by defining the high information asymmetry group as the sample firm with the information asymmetry proxies greater or less than proxy variable median. Table 6 presents the results.

[Insert Table 6 Here]

In Panel A, The information asymmetry proxy is informativeness of financial statements. According to preceding explanation, the high information asymmetry group as the sample firms with informativeness of financial statements less than median, and the low information asymmetry group as the sample firms with adjusted R^2 greater than median. The result shows that high level earnings management and information asymmetry portfolio experience negative buy-and-hold returns for the three-year period after issuing convertible debt. The average BHR is -12.39% and the matching firm's adjusted BHR (industry-size and size-B/M) are -53.93% and -61.07%. Furthermore, the two groups, which with high information asymmetry and with different earnings management level, the mean difference in buy-and-hold raw returns between the high and low earnings management groups is -33.32% and is significant at the 5% level; and the mean difference in buy-and-hold adjusted returns (industry-size and size-B/M matched matching firm adjusted) between the high and low earnings management groups are -66.24% and -58.30% and all are significant at the 1% level. In contrast, there are no visible patterns between low information asymmetry and different earnings management groups.

To test the robustness of our results, we also use analyst following, residual standard deviation, announcement reaction, and analysts' forecast error as the information asymmetry variables to define the four subgroups. We report the result in Table 6, Panels B through E, respectively. The results in Panels B through E are similar to those in Panel A. The high earnings management and high information asymmetry group experiences a more negative average buy-and-hold returns than other groups. Paying attention to the two high information asymmetry groups, the mean difference in buy-and hold raw returns between the high and low earnings

management groups is negative, and statistically significant in Panels B through E. And then the mean difference in buy-and hold adjusted returns between the high and low earnings management groups is also negative, and also statistically significant in Panels B through E. Yet, in the two low information asymmetry groups, the mean difference in buy-and hold raw or adjusted returns between the high and low earnings management groups are not constant, and statistically insignificant in Panels B through E.

In summary, the results in Table 6 generally support the theoretical predictions for the role of information asymmetry and earnings management in explaining the long-run performance of convertible debt issuing. The long-run performance for the high earnings management and information asymmetry firms is most negative, while the long-run performance is not significant patterns for those other firms. Furthermore, if the firms have high information asymmetry characteristic, the earnings management factor just can predict the long-run performance; if the firms have great information environment, the earnings management do not have explainable ability to forecast the long-run performance.

B.2 Cross-Sectional Regression Analyses

Table 7 presents cross-sectional regression analyses of the buy-and-hole returns for our sample. The number of observations varies across regressions, because of the data unavailability. The dependent variables are nature logarithm of raw BHR (LBHR), nature logarithm of industry-size matched matching firms adjusted BHR (LBHAR1), and nature logarithm of size-B/M matched matching firms adjusted BHR (LBHAR2).

[Insert Table 7 Here]

In Panel A, the model 1, 3, and 5 include the discretionary current accruals (DCA)

as the only explanatory variable. We find in these three models that the coefficient for the DCA is negative and statistically significant at the 1% level. This finding is similar to Tech, Welch, and Wong (1998a and 1998b), and Louis (2004) and shows that the long-run performance is more unfavorable for firms with greater earnings management than for those with less earnings management. The results in these three models are consistent with those in Table 5.

In Model 2, 4, and 6, we follow those three simple models and join an interaction term; discretionary current accruals (DCA) multiplied by information asymmetry dummy, as the two independent variables. We use median informativeness of financial statements as the cut-off values to define the high and low information asymmetry subgroups. The analysis also control for other potential determinants of the long-run performance for the firms of convertible debt issuing. The literature, suggests that several other factors could also influence the long-run returns associated with convertible debt issuing firms. These factors include issuer's logged capitalization at December 1997 prices (Log(MV)), natural logarithm of the book-to-market ratio (Log(BM)) and natural logarithm of the one plus the contemporaneous three-year value-weighted buy-and-hold market index (Log(1+BHRV)) (as Lee, 1997, Teoh, Welch, and Wong, 1998a and 1998b).

According to the regression results, the coefficient for the DCA is not consistent and statistically insignificant. However, the interaction term (DCA*IAD) is negatively related to the convertible debt issuing firms' long-run performance and is significant at the 1% level. It implies that information asymmetry is an important factor to affect the earnings management's explainable ability. In high level of information asymmetry, the discretionary current accrual (DCA) has significantly negative related to long-run performance; in low level of information asymmetry, the

discretionary current accrual has insignificantly relation with long-run performance. The results are again consistent with those in Table 6.

To test the robustness of our results, we also use analyst following, residual standard deviation, announcement reaction, and analysts' forecast error as the proxies to measure the information asymmetry. We report the results in Table 7, Panels B through E, respectively. The results in Panels B through E are similar to those in Panel A. The interaction term (DCA*IAD) is still significantly negatively related to the convertible debt issuing firms' long-run performance. The high information asymmetry groups experiences a significantly negative relationship between earnings management and long-run performance whereas the relationship between earnings management and long-run performance of the low information asymmetry groups is statistically insignificant. The result is again consistent with the theoretical prediction for the role of information asymmetry in explaining the relation between the long-run performance and earnings management of the convertible debt issuing firms.

B.3 Calendar Time Abnormal Return Analyses

B.3.1 Fama and French Three-factor Model

Table 8 reports the results of the three-year calendar time abnormal returns for the sample of convertible debt issuing when using the Fama and French three-factor model. In Panel A, Table 8, we use the informativeness of financial statement to measure the extent of information asymmetry. And we classified our sample into four subgroups, as the method of use in Table 6: High information asymmetry and high earnings management, high information asymmetry and low earnings management, low information asymmetry and high earnings management, and low information asymmetry and low earnings management. Panel A shows the equal- and value-weighted portfolios. In high information asymmetry and high earnings

management group, the intercept for the three-factor model is negative and significant at the 1% level. In high information asymmetry and low earnings management group, the intercept for the three-factor model also is negative and significant at the 5% level. In high information asymmetry groups, firms with high earnings management have more negative intercept (-2.274) than firm with low earnings management (-1.257). However, the two groups with low information asymmetry, we find that the intercepts for the regressions are insignificant. The results in Panel A are consistent with those in Table 6.

In calendar-time abnormal return analyses, we also use different information asymmetry proxies: analyst following, residual standard deviation, announcement reaction, and analysts' forecast error. We report the result in Table 8, Panels B through E. The results in Panels B through E are similar to those in Panel A. The group with high information asymmetry and high earnings management experiences a significantly negative abnormal return (intercept). The abnormal return of high information asymmetry and high earnings management group is more negative than the abnormal returns of high information asymmetry and low earnings management group in Panels B through E.

In summary, the results in Table 8[1] also support the theoretical predictions for the role of information asymmetry in explaining the relationship between long-run stock performance and earnings management. The long-run stock performance for the firm with high information asymmetry and high earnings management is significantly negative. Furthermore, the long-run performance is significantly more unfavorable for the firm with high information asymmetry than for those with low information

[1] We have also used weighted least squares (WLS) procedures to estimate the α_p. The WLS model is used to reveal any event bunching effect that may occur with selective management events (Loughran and Ritter, 2000). Our conclusions in the study remain unchanged.

asymmetry.

B.3.2 Carhart Four-factor Model

We have also estimated the intercept of four-factor model as Carhart (1997). The result is reported in Table 9. In Panel A, we still use the informativeness of financial statement to measure the extent of information asymmetry. In high information asymmetry and high earnings management group, the intercept for the equal-weighted portfolio is significantly negative (-1.305) at the 1% level. And the intercept for the value-weighted portfolio is still negative (-1.238) and significant at the 10% level. And in high information asymmetry and low earnings management group, the intercept for the four-factor model is insignificantly negative. At same time, the two groups with low information asymmetry, we find that the monthly abnormal returns (intercepts for the regression) are insignificant different from zero.

The Panel B to E in Table 9[2], we also use different information asymmetry proxies: analyst following, residual standard deviation, announcement reaction, and analysts' forecast error. The results in Panel B through E are similar to those in Panel A. The group with high information asymmetry and high earnings management shows a significantly negative abnormal return (intercepts) for equal-weighted portfolio at 1% to 5% level and a weakly negative abnormal return for value-weighted portfolio at 5% to 10% level. The abnormal return of high information asymmetry and high earnings management groups are more negative than the abnormal returns of high information asymmetry and low earnings management or of those two low information asymmetry groups. The results in Panel B through E are consistent with those in Table 6, 7 and 8.

B.4 Cross-sectional Regression to Analyses Long-run Operating Performance

[2] The conclusions remain unchanged when we use WLS regression models to estimate the coefficients.

Table 10 we analyses the relation with long-run operating performance, information asymmetry and earnings management. The dependent variables are the change of net income to total assets (△NI/TA), the change of earnings before interest and taxes expenses to total assets (△EBIT/TA), and change of return of assets (△ ROA, the change of net income before extraordinary items divided by total assets). Total assets are lagged total assets. These three measures are the abnormal operating performance, as measured by the benchmark approach: size and book-to-market ratio matched matching firm. The method as the Table 7, the Model 1, 3, and 5 include only one explanatory variable, discretionary current accrual (DCA), and the Model 2, 4, and 6 have DCA, interaction term, DCA multiply with information asymmetry dummy variable (DCA*IAD), and two control variables. We control for other potential determinants of the operating performance to the convertible debt issuing. We follow Rangan (1998) to control growth ratio in sales and the change in capital expenditures from year 1 to year 3. Two control variables are scaled by lagged total assets.

In Panel A, we still use informativeness of financial statement (adjusted-R^2) as information asymmetry proxy. We find in three simple regression models that the coefficient for the DCA is negative and statistically significant at the 5% level. We also analyses in three multiple models that the coefficient for DCA is insignificant, however, the coefficient for interaction term (DCA*IAD) is negative and statistically weakly significant at 5% to 10% level. That is, the operating performance is also significantly more unfavorable for the firms with high information asymmetry and high earnings management than those with low information asymmetry and low earnings management. The result is again consistent with the theoretical prediction for the role of information asymmetry in explaining the relationship between operating performance and earnings management of convertible debt issuing firms.

In Panels B through E, we use the other proxies for information asymmetry: analyst following, residual standard deviation, announcement reaction, and analysts' forecast error. The results in Panels B through D are similar to those in Panel A, but the result in Panel E is inconsistent. Although the result in Panel E is inconsistent, the other four panels' results in Table 10 still support the notion that the information asymmetry is an important consideration in discussing the relationship between the operating performance and earnings management of convertible debt issuing firms.

Ⅴ. Conclusion

The impact of earnings management related to the long-run performance has been analyzed extensively in the theoretical literature. This issue, has been neglected in the empirical literature on corporate financing. This study, however, propose that information asymmetry plays an important role to explain the connection between earnings management and long-run performance.

We investigate a sample of firms that issued convertible debt during the period 1989-2000. We show that consistent with previous studies, the convertible debt issuing firms are, on average, associated with significantly negative long-run performance. We further divide our sample by degree of earnings management of issuing firms. We find that issuing firms with aggressive earnings management have significantly negative long-run performances, but those with conservative earnings management have insignificant long-run performance. In cross-sectional regression analyses of long-run performance for the issuing firms, we show that the long-run performance of a convertible debt offering is significantly negatively related to the earnings management.

Afterward we examine the role of information asymmetry in determining the

relation between earnings management and long-run performance. We divide our sample by information asymmetry and earnings management. The sample can be classified into four subgroups: High information asymmetry and high earnings management, high information asymmetry and low earnings management, low information asymmetry and high earnings management and low information asymmetry and low earnings management. We find that issuing firms with high information asymmetry have more a significantly negative long-run performance than others. In the high degree of information asymmetry characteristic, earnings management significantly negatively related with long-run performance, but in the low degree of information asymmetry characteristic, the earnings management and long-run performance are insignificantly correlation. In cross-sectional stock performance regressions and calendar time abnormal returns models analyses the information asymmetry play an important role to affect the connection between earnings management and firm performance. The result show that long-run performance of convertible debt offering is significantly negatively related to the earnings management in the high information asymmetry characteristic; but is insignificantly related to the earnings management in the low information asymmetry characteristic.

We also examine the relation between the operating performance and earnings management in the difference informative characteristic. Firstly, we show that the relation between earnings management and operating performance is significantly negative. We also further divide our sample by the information asymmetry. We find that when the degree of information asymmetry of firm is high, the operating performance is significantly negatively related to earnings management. On the other hand, when the degree of information asymmetry of firm is low, the relation between operating performance and earnings management is in significantly.

The over all evidence in our study suggests that the relation between long-run performance and earnings management depends on the information asymmetry. Our findings suggest that the role of information asymmetry is important in assessing the relationship between earnings management and long-run performance. Therefore, our research enhances the understanding of information asymmetry's impact on the connection between earnings management and long-run performance in general.

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Table 1
Sample Distribution

This table summarizes the sample distribution of firms issuing convertible debt from 1989 to 2000. The sample firms are collected from SDC and have at least one-month post-issue stock return from CRSP beyond the day after financial statement reported date in fiscal year 0 (the fiscal year containing the issue date) and sufficient COMPUSTAT data to calculate discretionary current accrual in fiscal year 0. There are 205 issuing firms. The distribution of the sample is reported in Panel A by first two-digit SIC code as classified by COMPUSTAT, and in Panel B by convertible debt issuing fiscal year.

Panel A: Industry Distribution

Standard industry classification	Industry	Number	Percent of Sample
10,12~14	Mining	11	5.4
15~17	Construction	5	2.4
20,22~36	Manufacturing	70	34.1
37~39	Equipment	17	8.3
40~42,44,45,47,48	Transportation, Communications, Electric, Gas, And Sanitary Services	17	8.3
50,51	Wholesale Trade	19	9.3
52~59	Retail Trade	25	12.2
70,72,73,75,76,78~80,83, 87	Services	40	19.5
99	No classifiable Establishments	1	0.5
Total		205	100.0

Panel B: Time Distribution

Year	Number	Percent of Sample
1989	31	15.1
1990	14	6.8
1991	21	10.2
1992	27	13.2
1993	34	16.6
1994	10	4.9
1995	10	4.9
1996	15	7.3
1997	17	8.3
1998	7	3.4
1999	7	3.4
2000	12	5.9
Total	205	100.0

Table 2
Summary Statistics

The sample consists of 205 convertible bond-issuing firms from 1989 to 2000. The sample firms must have at least one-month post-issue stock return from CRSP beyond the day after financial statement reported data in fiscal year 0 and sufficient COMPUSTATe data to calculate discretionary current accruals in fiscal year 0. **Discretionary current accrual (DCA)** is extracted from current accruals by a within two-digit SIC industry cross-sectional modified Jones (1991) model. $\boldsymbol{R^2}$ is time-series adjusted-R^2 of model $P_{it} = a + b_1 E_{it} + b_2 BV_{it} + e_{it}$. This variable is set to missing if fewer than 5 yearly observations are available from 1960 to 2000. **Log (Analyst following)** is nature logarithm of one plus the number of analyst following the firm at fiscal year -1, and if the analyst following is unavailable, number of analysts following the firm is set to zero. **Residual standard deviation** is the dispersion in the market-adjusted daily stock returns in the year preceding the issuing convertible debt. **Announcement reaction** is standard deviation of the three-day cumulative abnormal returns around the announcements of quarterly earnings in five-year period before the issuing convertible debt. **Forecast error** is defined as the ratio of the absolute value of the difference between the actual earnings and the forecast earnings to the price per share at the beginning of the month. **Buy-and-hold return (BHR)** is three years buy-and-hold returns to sample firms following the first financial reporting announcement date of the convertible debt issuing. **Buy-and-hold abnormal returns (BHAR1 and BHAR2)** are the sample firm's three years buy-and-hold return mines the matching firm's three years buy-and-hold return. The matching firms are firms that match on the industry and market value of common equity criteria or the market value of common equity and book to market of common equity ratio criteria. $\Delta NI / TA$, $\Delta EBIT / TA$,and ΔROA are the change of net income, change of earnings before interest and taxes, and income before extraordinary items. These operating measures are scaled by lagged total assets and deducted by matching firm's operating performance. The matching firms are firms that match on the market value of common equity and book to market ratio criteria. **Issue size** is the amount of the convertible bond issuing. **Firm size** is measured as the capitalization of the firm in 1997 prices. **The relative issue size** is the issue size divided by the firm size. **B/M ratio** is the ratio of book value of comment equity to market value of common equity. **E/P ratio** is the ratio of earnings per share to price per share. $\Delta sales$ is the ratio of the net sales change to lagged assets. The firm characteristics variables are measured at the end of fiscal year -1.

Variables	N	Mean	Std.	Q_1	Median	Q_3
Panel A: Earnings management and Information Asymmetry						
DCA	205	0.04	0.22	-0.04	0.02	0.08
R^2	202	0.25	0.32	0.48	0.24	0.04
Log (Analyst Following)	202	1.63	1.16	2.56	1.95	0.00
Residual Std. Dev.	199	0.03	0.01	0.04	0.03	0.02
Announcement Reaction	141	3.62	19.68	0.10	0.06	0.04
Forecast Error	135	0.02	0.08	0.01	0.00	0.00
Panel B: Long-run Performance						
BHR (%)	205	13.55	81.55	-45.16	1.41	51.71
BHAR1 (%)	205	-16.20	96.80	-59.18	-11.67	28.74
BHAR2 (%)	205	-26.91	116.47	-95.37	-26.37	42.51
$\Delta NI / TA$	205	-0.03	0.33	-0.11	-0.03	0.03
$\Delta EBIT / TA$	205	-0.04	0.22	-0.13	-0.04	0.04
ΔROA	205	-0.03	0.32	-0.11	-0.03	0.03
Panel C: Firm Characteristics						
Issue Size ($mil)	205	145.39	193.37	60.00	100.00	150.20
Firm Size ($mil)	205	1543.19	3664.16	166.83	397.37	1209.66
Relative Issue Size (%)	205	31.65	46.41	12.34	20.99	36.31
$\Delta sales$ (%)	205	36.95	54.01	4.85	18.30	46.81
B/M (%)	205	53.06	51.05	24.52	41.98	61.97
E/P (%)	205	-1.90	28.20	0.31	2.06	4.08

Table 3
Time-series Profile of Accruals and Operating Performance

The sample consists of 205 convertible bond-issuing firms from 1989 to 2000. This table presents the discretionary and nondiscretionary current and long-term accruals of firms offering convertible bond offerings from the three years before to three years after the offerings. In Panel A, The nondiscretionary accruals reflect accruals choices largely dictated by economic conditions, whereas the discretionary accruals are discretionary accruals are designed to pick up reporting choices that are largely managed by the firm. Discretionary current accruals (DCA) are extracted from current accruals by a within two-digit SIC industry cross-sectional modified Jones (1991) model. DCA measures the amount of earnings management. The accruals measures are scaled by beginning-period total assets. Panel B presents time-series statistics on two accounting performance measures, net income and cash flow from operations, lagged total assets. The accounting performance measures are relative to their two-digit industry median, e.g., $NI_{i,t} / TA_{i,t-1} - \overline{NI}_t / \overline{TA}_{t-1}$, where we indicates the firm and overlined variables are industry medians, and TA is total assets. Reported net income consists of total accruals and cash flows from operations (CFO). Operating performance measures in Panels B are scaled by lagged total assets. *p*-values for the Wilcoxon signed-rank tests in Panel A and B are two-tailed.

Panel A: Time-Series Distribution of Accruals							
Fiscal Year	**-3**	**-2**	**-1**	**0**	**1**	**2**	**3**
N	130	130	205	205	195	183	166
Discretionary Current Accrual	0.011	-0.006	-0.006	0.018	0.004	0.002	0.006
p (sign-rank)	77.01	23.06	77.99	0.51***	19.73	70.42	44.11
Nondiscretionary Current Accrual	0.016	0.008	0.012	0.014	0.007	0.007	0.002
p (sign-rank)	0.00***	0.00***	0.00***	0.00***	0.00***	0.00***	0.05***
Discretionary Long-Term Accrual	-0.053	-0.003	-0.001	0.003	-0.007	0.001	-0.012
p (sign-rank)	0.00***	75.07	45.87	56.46	6.31*	50.95	13.93
Nondiscretionary Long-Term Accrual	-0.065	-0.069	-0.062	-0.064	-0.054	-0.055	-0.052
p (sign-rank)	0.00***	0.00***	0.00***	0.00***	0.00***	0.00***	0.00***
Panel B: Time-Series Distribution of Accounting Performance							
Fiscal Year	**-3**	**-2**	**-1**	**0**	**1**	**2**	**3**
Industry-adjusted net income	0.019	0.025	0.030	0.034	0.021	0.004	0.007
p (sign-rank)	2.33**	0.02***	0.00***	0.00***	0.10***	45.93	53.75
Industry-adjusted cash flows	0.013	0.012	0.028	0.006	0.021	0.022	0.008
p (sign-rank)	3.63**	17.04	1.18**	19.88	0.78***	2.16**	9.87*

Table 4
Cross-sectional Characteristics of Discretionary Current Accruals, the Proxy for Earnings Management

The sample consists of 205 convertible bond-issuing firms from 1989 to 2000. This table reports summary statistics by issue year DCA quartile for: discretionary current accruals (always scaled by lagged assets), inflation-adjusted market capitalization (MV*), book-to-market ratio (B/M), earnings-to-price ratio (E/P), and net income (NI/TA_{-1}, scaled by lagged assets).

Summary Statistics of Firm Characteristics in Issue Year by DCA Quartile

			DCA						
		N	**Median**	**Mean**	**Std. Dev.**	**MV* (1997$mil)**	**B/M**	**EP**	**NI/TA**
Conservative Q1	DCA<=-0.036	52	-0.072	-0.131	0.125	401.10	0.404	0.010	0.049
Quartile 2	-0.036<DCA<=0.018	51	-0.007	-0.008	0.015	521.43	0.446	0.023	0.049
Quartile 3	0.018<DCA<=0.083	51	0.035	0.040	0.017	302.66	0.554	0.028	0.045
Aggressive Q4	0.083<DCA	51	0.171	0.278	0.301	402.83	0.346	0.021	0.071
All firms		205	0.018	0.044	0.220	397.37	0.420	0.021	0.054

Table 5
Long-Horizon Mean Abnormal Returns by Issue Year DCA Quartiles

The sample consists of 205 issuing convertible debt firms in the period from 1989-2000. The benchmarks for expected returns are the value-weighted market index and matching firm (industry-market value and market value-B/M ratio) concurrent period returns. The holding period is first day after the release of the first post-issue financial statements. Quartile 1 firms are most conservative; quartile 4 firms are most aggressive, in the amount of earnings management of the first post-issue financial statements. The proxy for earnings management (discretionary current accruals, DCA) is described in Table 3. Buy-and-Hold abnormal returns,

$$BHAR = \prod_{t=1}^{T}(1 + R_{it}) - \prod_{t=1}^{T}(1 + R_{ctri,t})$$

When sample firm returns are missing both r_i and m_i are set to zero, are statistic computed from the cross section of multimonth returns net of multimonth benchmark returns. The parentheses report *t*-statistics. "***" represents a 1% significance level; "**" represents a 5% significance level; "*" represents a 10% significance level.

	All	**Q1**	**Q2**	**Q3**	**Q4**
N	205	52	51	51	51
Raw returns (%)	13.55 (2.38)**	27.29 (1.77)*	16.02 (1.75)*	21.15 (2.28)**	-10.52 (-1.06)
Market-adj. (%) Value-weighted	-36.06 (-6.29)***	-20.87 (-1.35)	-30.44 (-3.37)***	-35.93 (-3.69)***	-57.33 (-5.73)***
Market-adj. (%) Equal-weighted	-148.71 (-24.40)***	-144.23 (-10.32)***	-139.23 (-12.74)***	-146.91 (-12.39)***	-164.54 (-13.96)***
Matching firm adj. (%) Sic-Size	-16.20 (-2.40)**	12.85 (0.89)	0.97 (0.09)	-33.10 (-2.40)**	-46.09 (-3.42)***
Matching firm adj. (%) Size-B/M	-26.91 (-3.31)***	-12.73 (-0.72)	9.00 (0.85)	-11.81 (-0.86)	-92.39 (-5.00)***

Table 6
Returns for Portfolios Formed Based on Information Asymmetry and Earnings Management

This table presents average three-year buy-and-hold returns based on information asymmetry and earnings management. The benchmarks for expected returns are the industry and market value matching firms and the market value and book to market ratio matching firms. We construct portfolios based on the Information asymmetry (IA) of the firm in the prior year and discretionary current accruals (DCA). Five variables proxy information asymmetry: (1) informativeness of Financial Statement, is time-series adjusted-R^2 of model $P_{it} = a + b_1 E_{it} + b_2 BV_{it} + e_{it}$; (2) financial analyst following, the nature logarithm of one plus the number of analyst following the firm at fiscal year -1; (3) residual standard deviation is the dispersion in the market-adjusted daily stock returns in the year preceding the issuing convertible debt; (4) announcement reaction is standard deviation of the three-day cumulative abnormal returns around the announcements of quarterly earnings in five year period before the issuing convertible debt; (5) analyst forecast error are defined as the ratio of the absolute value of the difference between the actual earnings and the forecast earnings to the price per share at the beginning of the month. Discretionary current accrual (DCA) is extracted from current accruals by a within two-digit SIC industry cross-sectional modified Jones (1991) model. Firm are placed into the "High" IA category if Informativeness of Financial Statement and analyst following $\leqq$ median, residual std. dev., announcement reaction and analyst forecast error $\geqq$ median, otherwise are "Low" IA. And then firm are classified into the "High" EM type if DCA$\geqq$DCA median and "Low" EM type if DCA<DCA median. "***" represents a 1% significance level; "**" represents a 5% significance level; "*" represents a 10% significance level.

Panel A: Informativeness of Financial Statement

		EM		
		High	Low	
IA	N	52	49	Diff. (%)
High	BHR (%)	-12.39	20.94	-33.32**
	BHAR1 (%)	-53.93	12.32	-66.24***
	BHAR2 (%)	-61.07	-2.77	-58.30***
Low	N	49	52	
	BHR (%)	25.09	13.38	11.71
	BHAR1 (%)	-25.87	-4.41	-21.47
	BHAR2 (%)	-35.29	-10.16	-25.13

Panel B: Financial Analyst Following

		EM		
		High	Low	
IA	N	57	50	Diff. (%)
High	BHR (%)	-11.29	15.67	-26.95*
	BHAR1 (%)	-49.40	11.43	-60.83***
	BHAR2 (%)	-69.33	-3.68	-65.65***
Low	N	44	51	
	BHR (%)	21.22	26.98	-5.76
	BHAR1 (%)	-25.52	2.93	-28.45
	BHAR2 (%)	-28.69	-1.51	-27.19

Table 6 (continued)

Panel C: Residual Std. Dev.				
		EM		
		High	Low	
IA	N	54	46	Diff. (%)
High	BHR (%)	-22.34	6.48	-28.82*
	BHAR1 (%)	-63.22	-5.56	-57.67***
	BHAR2 (%)	-57.82	-12.97	-44.85**
Low	N	46	53	
	BHR (%)	32.28	24.39	7.89
	BHAR1 (%)	-13.64	9.19	-22.84
	BHAR2 (%)	-35.06	-2.91	-32.15

Panel D: Financial Report Announcement Reaction				
		EM		
		High	Low	
IA	N	35	36	Diff. (%)
High	BHR (%)	-24.58	8.63	-33.21*
	BHAR1 (%)	-63.90	0.16	-64.06***
	BHAR2 (%)	-79.05	-18.09	-60.96**
Low	N	33	37	
	BHR (%)	41.86	49.31	-7.45
	BHAR1 (%)	-6.01	29.48	-35.49
	BHAR2 (%)	-17.60	27.35	-44.95

Panel E: Analyst Forecast Error				
		EM		
		High	Low	
IA	N	32	36	Diff. (%)
High	BHR (%)	-2.09	40.16	-42.25*
	BHAR1 (%)	-31.32	16.69	-48.01**
	BHAR2 (%)	-70.22	-9.39	-60.83*
Low	N	28	39	
	BHR (%)	30.60	17.70	12.90
	BHAR1 (%)	-14.23	6.83	-21.06
	BHAR2 (%)	-15.48	7.57	-23.06

Table 7
Cross-sectional Regression Analysis of Information Asymmetry and Earnings Management Affecting the Long-run Performance of Firm Issuing the Convertible Debt

The sample consists of 205 firms in the period from 1989-2000. The sample firms must have at least one-month post-issue stock return from CRSP beyond the day after financial statement reported date in fiscal year 0 and sufficient COMPUSTAT data to calculate discretionary current accruals in fiscal year 0. The dependent variables are the nature logarithm of one plus three-year buy-and-hold returns to sample firms following an announcing date of the first post-issue financial statements and their buy-and-hold adjusted abnormal returns relative to their matching firms under different characteristics. The matching firms are firms that match on the basis of industry and market value and market value and book to market value ratio. Five variables proxy information asymmetry: (1) informativeness of Financial Statement, is time-series adjusted-R^2 of model $P_{it} = a + b_1 E_{it} + b_2 BV_{it} + e_{it}$; (2) financial analyst following, the nature logarithm of one plus the number of analyst following the firm at fiscal year -1; (3) residual standard deviation is the dispersion in the market-adjusted daily stock returns in the year preceding the issuing convertible debt; (4) announcement reaction is standard deviation of the three-day cumulative abnormal returns around the announcements of quarterly earnings in five year period before the issuing convertible debt; (5) analyst forecast error are defined as the ratio of the absolute value of the difference between the actual earnings and the forecast earnings to the price per share at the beginning of the month. Discretionary current accrual (DCA) is extracted from current accruals by a within two-digit SIC industry cross-sectional modified Jones (1991) model. IAD is a dummy variable, which equals 1 for "High" information asymmetry and 0 otherwise. Log (MV) is the nature logarithm of the market value of the sample firm's common equity. Log (BM) is nature logarithm of book value divided by market value. Log (1+BHRV) is nature logarithm of one plus three-year buy-and-hold value-weighted market index. The parentheses report *t*-statistics. "***" represents a 1% significance level; "**" represents a 5% significance level; "*" represents a 10% significance level.

Dep. Var.	**LBHR**		**LBHAR1**		**LBHAR2**	
Model	1	2	3	4	5	6
Panel A: Informativeness of Financial Statement						
Intercept	0.102 (0.57)	-1.145 (-2.33)**	0.170 (0.87)	0.540 (1.00)	-0.188 (-0.84)	-0.611 (-0.99)
DCA	-1.107 (-3.62)***	0.382 (0.76)	-1.607 (-4.82)***	0.201 (0.36)	-1.154 (-3.03)***	1.080 (1.70)*
DCA*IAD		-2.016 (-3.28)***		-2.680 (-3.96)***		-3.235 (-4.17)***
Log (MV)		0.180 (3.87)***		0.054 (1.05)		0.096 (1.63)
Log (B/M)		0.101 (1.01)		-0.033 (-0.30)		0.068 (0.54)
Log (1+BHRV)		0.654 (0.71)		-1.960 (-1.93)**		-0.319 (-0.27)
Year Dummy	Yes	Yes	Yes	Yes	Yes	Yes
N	202	202	202	202	202	202
Adjusted R^2	0.251	0.326	0.136	0.209	0.152	0.219
F-value	6.61***	7.09***	3.63***	4.32***	4.01***	4.52***

Table 7 (continued)

Panel B: Financial Analyst Following						
Intercept	0.133 (0.74)	-1.074 (-2.16)**	0.184 (0.93)	0.646 (1.15)	-0.192 (-0.85)	-0.576 (-0.90)
DCA	-1.129 (-3.73)***	-0.033 (-0.08)	-1.609 (-4.85)***	-0.599 (-1.23)	-1.187 (-3.12)***	0.341 (0.61)
DCA*IAD		-1.670 (-2.94)***		-1.754 (-2.74)***		-2.541 (-3.49)***
Log (MV)		0.173 (3.64)***		0.040 (0.75)		0.089 (1.46)
Log (B/M)		0.121 (1.24)		-0.005 (-0.05)		0.108 (0.86)
Log (1+BHRV)		0.635 (0.69)		-1.940 (-1.86)*		-0.265 (-0.22)
Year Dummy	Yes	Yes	Yes	Yes	Yes	Yes
N	202	202	202	202	202	202
Adjusted R^2	0.260	0.331	0.138	0.178	0.152	0.201
F-value	6.87***	7.22***	3.68***	3.72***	4.00***	4.16***
Panel C: Residual Std. Dev.						
Intercept	0.037 (0.20)	-1.117 (-2.23)**	0.159 (0.78)	0.701 (1.25)	-0.224 (-0.96)	-0.662 (-1.04)
DCA	-1.123 (-3.69)***	0.025 (0.05)	-1.594 (-4.78)***	-0.412 (-0.76)	-1.137 (-3.01)***	0.452 (0.74)
DCA*IAD		-1.583 (-2.61)***		-1.851 (-2.73)***		-2.374 (-3.08)***
Log (MV)		0.168 (3.54)***		0.032 (0.61)		0.076 (1.26)
Log (B/M)		0.098 (0.99)		-0.031 (-0.27)		0.075 (0.59)
Log (1+BHRV)		0.570 (0.60)		-2.104 (-1.99)**		0.003 (0.00)
Year Dummy	Yes	Yes	Yes	Yes	Yes	Yes
N	199	199	199	199	199	199
Adjusted R^2	0.249	0.311	0.134	0.173	0.159	0.193
F-value	6.47***	6.59***	3.55***	3.59***	4.13***	3.97***

Table 7 (continued)

Panel D: Financial Report Announcement Reaction						
Intercept	0.095 (0.58)	-1.055 (-1.95)*	0.182 (0.94)	1.017 (1.60)	-0.174 (-0.77)	-0.262 (-0.36)
DCA	-0.963 (-3.11)***	-0.129 (-0.27)	-1.479 (-4.06)***	-0.060 (-0.11)	-0.837 (-1.98)**	0.688 (1.06)
DCA*IAD		-1.272 (-2.07)**		-2.383 (-3.31)***		-2.454 (-2.93)***
Log (MV)		0.129 (2.48)**		-0.008 (-0.14)		0.053 (0.75)
Log (B/M)		0.205 (1.95)*		0.053 (0.43)		0.240 (1.68)*
Log (1+BHRV)		1.401 (1.35)		-2.063 (-1.70)*		-0.214 (-0.15)
Year Dummy	Yes	Yes	Yes	Yes	Yes	Yes
N	141	141	141	141	141	141
Adjusted R^2	0.371	0.414	0.169	0.231	0.193	0.242
F-value	7.88***	7.17***	3.37***	3.63***	3.79***	3.79***
Panel E: Analyst Forecast Error						
Intercept	0.341 (1.87)*	-0.423 (-0.75)	0.402 (2.07)**	1.440 (2.49)**	0.182 (0.71)	0.163 (0.21)
DCA	-1.163 (-3.64)***	-0.381 (-0.83)	-1.614 (-4.73)***	-0.503 (-1.07)	-1.087 (-2.43)**	0.218 (0.35)
DCA*IAD		-1.375 (-2.13)**		-2.390 (-3.60)***		-2.650 (-2.98)***
Log (MV)		0.072 (1.25)		-0.093 (-1.58)		0.023 (0.29)
Log (B/M)		0.033 (0.28)		-0.062 (-0.51)		-0.123 (-0.76)
Log (1+BHRV)		0.926 (0.94)		-1.239 (-1.22)		-0.457 (-0.33)
Year Dummy	Yes	Yes	Yes	Yes	Yes	Yes
N	135	135	135	135	135	135
Adjusted R^2	0.331	0.348	0.193	0.267	0.190	0.229
F-value	6.53***	5.48***	3.68***	4.05***	3.61***	3.48***

Table 8
Long-run Abnormal Returns Following an Issuing Convertible Debt Using the Fama-French Calendar-time Portfolio Regressions

For each month from August 1989 to December 2004, we form a portfolio of all the sample firms that have offered convertible debt in the previous three-year and calculate both the equal- and value-weighted three-year abnormal returns. The monthly excess returns to the calendar time portfolios, R_{pt}-R_{ft}, are regressed on the Fama and French (1993) three-factor model in order to calculate the unadjusted intercept (α_p). The three factor time-series regression coefficients from

$$R_{pt} - R_{ft} = \alpha_p + \beta_m (R_{mt} - R_{ft}) + \beta_s SMB_t + \beta_h HML_t + \varepsilon_t$$

The three factors, from Fama and French (1993), are the excess returns on the market portfolio (R_{mt}-R_{ft}), the difference returns between the value-weighted portfolios of small stocks and big stocks (SMB_t), and the difference returns between the value-weighted portfolios of high book-to-market stocks and low book-to-market stocks (HML_t). The *t*-statistics are reported in parentheses. Five variables proxy information asymmetry: (1) informativeness of Financial Statement, is time-series adjusted-R^2 of model $P_{it} = a + b_1 E_{it} + b_2 BV_{it} + e_{it}$; (2) financial analyst following, the nature logarithm of one plus the number of analyst following the firm at fiscal year -1; (3) residual standard deviation is the dispersion in the market-adjusted daily stock returns in the year preceding the issuing convertible debt; (4) announcement reaction is standard deviation of the three-day cumulative abnormal returns around the announcements of quarterly earnings in five year period before the issuing convertible debt; (5) analyst forecast error are defined as the ratio of the absolute value of the difference between the actual earnings and the forecast earnings to the price per share at the beginning of the month. Discretionary current accrual (DCA) is extracted from current accruals by a within two-digit SIC industry cross-sectional modified Jones (1991) model. "High" IA implies firm with high information asymmetry. "High" EM implies firm with "High" earnings management. The parentheses report *t*-statistics. "***" represents a 1% significance level; "**" represents a 5% significance level; "*" represents a 10% significance level.

EM	IA	Intercept	Rm_Rf	SMB	HML	Adjusted R^2	Intercept	Rm_Rf	SMB	HML	Adjusted R^2
		Equal-weighted Portfolio					Value-weighted Portfolio				
Panel A: Informativeness of Financial Statement											
Low	Low	-0.818 (-1.55)	1.335 (9.57)***	0.735 (4.86)***	0.444 (2.38)**	0.449	-0.359 (-0.55)	1.353 (7.77)***	0.218 (1.16)	0.498 (2.14)**	0.283
High	Low	-1.303 (-1.50)	1.765 (7.85)***	0.824 (3.37)***	-0.077 (-0.26)	0.402	-0.099 (-0.10)	1.612 (6.11)***	0.884 (3.08)***	-0.608 (-1.72)*	0.368
Low	High	-1.257 (-2.21)**	1.271 (8.60)***	0.565 (3.47)***	-0.090 (-0.45)	0.430	-1.259 (-1.31)	1.575 (6.31)***	0.306 (1.11)	-0.721 (-2.14)**	0.326
High	High	-2.274 (-4.50)***	1.541 (11.76)***	0.406 (2.81)***	0.104 (0.59)	0.533	-2.021 (-3.08)***	1.446 (8.50)***	0.143 (0.76)	-0.432 (-1.88)*	0.429

Table 8 (continued)

Panel B: Financial Analyst Following										
Low Low	-0.692 (-0.82)	1.640 (7.49)***	0.457 (1.89)*	-0.085 (-0.29)	0.338	0.463 (0.36)	1.518 (4.61)***	-0.316 (-0.87)	-0.757 (-1.70)*	0.185
High Low	-0.710 (-1.08)	1.694 (9.96)***	0.599 (3.23)***	-0.138 (-0.61)	0.509	-0.239 (-0.28)	1.548 (7.04)***	0.639 (2.67)***	-0.629 (-2.13)**	0.421
Low High	-1.136 (-1.93)*	1.500 (9.81)***	0.739 (4.38)***	0.449 (2.17)**	0.431	-1.515 (-1.89)*	1.708 (8.20)***	0.645 (2.81)***	-0.043 (-0.15)	0.384
High High	-2.318 (-4.23)***	1.371 (9.67)***	0.529 (3.38)***	0.081 (0.43)	0.457	-1.829 (-2.74)***	1.310 (7.59)***	0.358 (1.88)*	-0.458 (-1.96)*	0.409
Panel C: Residual Std. Dev.										
Low Low	-0.534 (-1.58)	1.179 (13.05)***	0.299 (3.12)***	0.405 (3.43)***	0.562	-0.193 (-0.35)	1.018 (6.91)***	-0.041 (-0.26)	0.258 (1.34)	0.253
High Low	-0.610 (-0.92)	0.994 (5.65)***	0.553 (2.90)***	0.519 (2.21)**	0.194	-0.680 (-1.13)	0.850 (5.34)***	0.525 (3.04)***	0.608 (2.86)***	0.170
Low High	-1.488 (-2.52)**	1.627 (10.49)***	0.862 (5.05)***	0.223 (1.07)	0.497	-1.860 (-1.92)*	2.102 (8.27)***	0.288 (1.03)	-0.861 (-2.52)**	0.429
High High	-2.626 (-4.25)***	1.715 (10.77)***	0.801 (4.62)***	-0.051 (-0.24)	0.560	-2.186 (-3.07)***	1.583 (8.62)***	0.324 (1.62)	-0.826 (-3.36)***	0.520
Panel D: Financial Report Announcement Reaction										
Low Low	0.202 (0.39)	1.172 (8.25)***	0.339 (2.30)**	0.735 (3.98)***	0.322	0.984 (1.44)	0.994 (5.31)***	-0.118 (-0.61)	0.284 (1.17)	0.170
High Low	0.645 (1.26)	0.924 (6.81)***	0.650 (4.42)***	-0.068 (-0.37)	0.399	0.647 (1.01)	0.954 (5.64)***	0.559 (3.05)***	-0.255 (-1.13)	0.328
Low High	-1.401 (-2.56)**	1.578 (11.00)***	0.704 (4.46)***	0.142 (0.74)	0.513	-1.703 (-1.82)*	1.924 (7.83)***	0.221 (0.82)	-0.767 (-2.32)**	0.396
High High	-2.322 (-3.90)***	1.822 (11.85)***	0.643 (3.84)***	0.014 (0.07)	0.576	-1.780 (-2.17)**	1.597 (7.54)***	0.348 (1.51)	-0.506 (-1.78)*	0.403

Table 8 (continued)

Panel E: Analyst Forecast Error										
Low Low	-0.917 (-1.38)	1.567 (9.05)***	0.404 (2.15)**	-0.209 (-0.90)	0.440	-0.187 (-0.15)	1.570 (4.86)***	-0.102 (-0.29)	-0.602 (-1.39)	0.188
High Low	-0.521 (-0.53)	1.919 (7.45)***	0.393 (1.40)	0.111 (0.32)	0.312	-0.660 (-0.55)	2.132 (6.75)***	0.054 (0.16)	-0.080 (-0.19)	0.269
Low High	-0.478 (-0.92)	1.297 (9.03)***	0.620 (4.15)***	0.885 (4.74)***	0.388	0.115 (0.16)	1.410 (7.33)***	0.277 (1.38)	0.906 (3.62)***	0.263
High High	-2.476 (-4.06)***	1.624 (10.06)***	0.495 (2.86)***	0.175 (0.82)	0.486	-2.124 (-2.63)***	1.373 (6.43)***	-0.083 (-0.36)	-0.580 (-2.05)**	0.348

Table 9
Long-run Abnormal Returns Following an Issuing Convertible Debt Using the Carhart's Four-factor Model

For each month from August 1989 to December 2004, we form a portfolio of all the sample firms that have offered convertible debt in the previous three-year and calculate both the equal- and value-weighted three-year abnormal returns. The monthly excess returns to the calendar time portfolios, R_{pt}-R_{ft}, are regressed on the Fama and Carhart (1997) four-factor model in order to calculate the unadjusted intercept (α_p). The four factor time-series regression coefficients from

$$R_{pt} - R_{ft} = \alpha_p + \beta_m (R_{mt} - R_{ft}) + \beta_s SMB_t + \beta_h HML_t + \beta_u UMD_t + \varepsilon_t$$

The four factors, from Carhart (1997), are the excess returns on the market portfolio (R_{mt}-R_{ft}), the difference returns between the value-weighted portfolios of small stocks and big stocks (SMB_t), and the difference returns between the value-weighted portfolios of high book-to-market stocks and low book-to-market stocks (HML_t). The UMD is defined as the difference between an equal-weighted portfolio return of stocks with the highest 30 percent returns and an equal-weighted portfolio return of stocks with the lowest 30 percent return in month t-12 to t-2. The *t*-statistics are reported in parentheses. Five variables proxy information asymmetry: (1) informativeness of Financial Statement, is time-series adjusted-R^2 of model $P_{it} = a + b_1 E_{it} + b_2 BV_{it} + e_{it}$; (2) financial analyst following, the nature logarithm of one plus the number of analyst following the firm at fiscal year -1; (3) residual standard deviation is the dispersion in the market-adjusted daily stock returns in the year preceding the issuing convertible debt; (4) announcement reaction is standard deviation of the three-day cumulative abnormal returns around the announcements of quarterly earnings in five year period before the issuing convertible debt; (5) analyst forecast error are defined as the ratio of the absolute value of the difference between the actual earnings and the forecast earnings to the price per share at the beginning of the month. Discretionary current accrual (DCA) is extracted from current accruals by a within two-digit SIC industry cross-sectional modified Jones (1991) model. "High" IA implies firm with high information asymmetry. "High" EM implies firm with "High" earnings management. The parentheses report *t*-statistics. "***" represents a 1% significance level; "**" represents a 5% significance level; "*" represents a 10% significance level.

EM	IA	Intercept	Rm_Rf	SMB	HML	UMD	Adjusted R^2	Intercept	Rm_Rf	SMB	HML	UMD	Adjusted R^2
		Equal-weighted Portfolio						Value-weighted Portfolio					
Panel A: Informativeness of Financial Statement													
Low	Low	-0.485 (-0.90)	1.260 (8.90)***	0.766 (5.10)***	0.387 (2.09)**	-0.246 (-2.31)**	0.464	0.203 (0.31)	1.226 (7.04)***	0.270 (1.46)	0.403 (1.77)*	-0.415 (-3.16)***	0.321
High	Low	0.124 (0.16)	1.345 (6.59)***	0.932 (4.36)***	-0.391 (-1.47)	-1.103 (-7.28)***	0.546	0.649 (0.63)	1.392 (5.17)***	0.941 (3.34)***	-0.772 (-2.20)**	-0.578 (-2.90)***	0.395
Low	High	-0.566 (-1.05)	1.072 (7.64)***	0.650 (4.32)***	-0.227 (-1.23)	-0.606 (-5.73)***	0.518	-0.438 (-0.46)	1.338 (5.40)***	0.408 (1.53)	-0.884 (-2.70)***	-0.720 (-3.85)***	0.376
High	High	-1.305 (-3.05)***	1.266 (11.36)***	0.485 (4.08)***	-0.104 (-0.71)	-0.772 (-9.18)***	0.687	-1.238 (-1.95)*	1.224 (7.40)***	0.206 (1.17)	-0.601 (-2.76)***	-0.624 (-5.00)***	0.500

Table 9 (continued)

Panel B: Financial Analyst Following												
Low	Low	0.366 (0.45)	1.342 (6.35)***	0.541 (2.40)**	-0.313 (-1.12)	-0.839 (-5.26)***	0.427	2.297 (1.93)*	1.000 (3.24)***	-0.170 (-0.52)	-1.151 (-2.83)***	-1.454 (-6.24)***	0.333
High	Low	0.387 (0.66)	1.371 (8.92)***	0.682 (4.23)***	-0.379 (-1.89)*	-0.847 (-7.44)***	0.631	0.204 (0.23)	1.417 (6.24)***	0.672 (2.83)***	-0.727 (-2.46)**	-0.342 (-2.03)**	0.432
Low	High	-0.637 (-1.09)	1.356 (8.91)***	0.800 (4.90)***	0.350 (1.74)*	-0.438 (-3.82)***	0.472	-1.221 (-1.49)	1.623 (7.58)***	0.681 (2.97)***	-0.101 (-0.36)	-0.258 (-1.60)	0.390
High	High	-1.286 (-2.76)***	1.079 (8.87)***	0.612 (4.73)***	-0.141 (-0.88)	-0.822 (-8.96)***	0.630	-1.279 (-1.91)*	1.154 (6.63)***	0.402 (2.17)**	-0.577 (-2.51)**	-0.438 (-3.34)***	0.442
Panel C: Residual Std. Dev.													
Low	Low	-0.228 (-0.68)	1.111 (12.47)***	0.335 (3.61)***	0.356 (3.11)***	-0.234 (-3.57)***	0.594	0.308 (0.56)	0.907 (6.24)***	0.018 (0.12)	0.178 (0.95)	-0.384 (-3.59)***	0.307
High	Low	-0.157 (-0.23)	0.892 (5.02)***	0.595 (3.16)***	0.442 (1.90)*	-0.334 (-2.49)**	0.220	-0.571 (-0.91)	0.825 (5.04)***	0.535 (3.08)***	0.589 (2.75)***	-0.080 (-0.65)	0.167
Low	High	-0.897 (-1.55)	1.460 (9.57)***	0.932 (5.70)***	0.106 (0.53)	-0.507 (-4.38)***	0.543	-1.048 (-1.09)	1.873 (7.37)***	0.383 (1.41)	-1.022 (-3.06)***	-0.697 (-3.62)***	0.465
High	High	-1.441 (-2.76)***	1.370 (10.08)***	0.891 (6.25)***	-0.310 (-1.75)*	-0.910 (-9.03)***	0.705	-1.658 (-2.31)**	1.429 (7.64)***	0.364 (1.86)*	-0.941 (-3.86)***	-0.405 (-2.92)***	0.541

Table 9 (continued)

Panel D: Financial Report Announcement Reaction												
Low Low	0.421 (0.79)	1.134 (7.91)***	0.354 (2.40)**	0.692 (3.73)***	-0.160 (-1.53)	0.329	1.283 (1.82)*	0.942 (4.98)***	-0.099 (-0.51)	0.226 (0.92)	-0.219 (-1.59)	0.179
High Low	0.730 (1.37)	0.905 (6.48)***	0.657 (4.44)***	-0.082 (-0.45)	-0.062 (-0.59)	0.397	0.917 (1.39)	0.894 (5.16)***	0.584 (3.18)***	-0.300 (-1.32)	-0.199 (-1.52)	0.333
Low High	-0.844 (-1.58)	1.421 (10.09)***	0.770 (5.10)***	0.032 (0.17)	-0.477 (-4.47)***	0.559	-0.960 (-1.03)	1.714 (6.95)***	0.308 (1.17)	-0.914 (-2.82)***	-0.638 (-3.41)***	0.430
High High	-1.184 (-2.35)**	1.487 (11.32)***	0.729 (5.30)***	-0.236 (-1.38)	-0.880 (-9.04)***	0.715	-1.093 (-1.33)	1.395 (6.51)***	0.400 (1.78)*	-0.657 (-2.35)**	-0.531 (-3.34)***	0.438
Panel E: Analyst Forecast Error												
Low Low	-0.121 (-0.19)	1.334 (8.00)***	0.494 (2.81)***	-0.369 (-1.70)*	-0.664 (-5.35)***	0.516	1.374 (1.17)	1.114 (3.61)***	0.075 (0.23)	-0.916 (-2.28)**	-1.303 (-5.67)***	0.311
High Low	1.192 (1.38)	1.422 (6.26)***	0.507 (2.12)**	-0.280 (-0.94)	-1.371 (-8.10)***	0.505	0.298 (0.25)	1.853 (5.81)***	0.117 (0.35)	-0.299 (-0.71)	-0.768 (-3.23)***	0.309
Low High	-0.236 (-0.44)	1.255 (8.66)***	0.636 (4.28)***	0.837 (4.46)***	-0.177 (-1.68)*	0.396	0.231 (0.32)	1.390 (7.10)***	0.285 (1.42)	0.883 (3.49)***	-0.085 (-0.60)	0.260
High High	-1.776 (-2.96)***	1.459 (9.24)***	0.555 (3.38)***	0.052 (0.26)	-0.503 (-4.30)***	0.538	-1.449 (-1.77)*	1.213 (5.66)***	-0.025 (-0.11)	-0.699 (-2.51)**	-0.485 (-3.06)***	0.381

Table 10
Cross-sectional Regression Analysis of Information Asymmetry and Earnings Management Affecting the Operating Performance after Issuing Convertible Debt

The dependent variables for regressions are the matching firms adjusted the total of the change in operating performance proxies. The operating performance measures, the net income (NI), earnings before interest and taxes (EBIT), and income before extraordinary items (IB). The operating performances are scaled by lagged total assets (TA). The matching firms are matched on the basis of market value and book to market value ratio. Five proxies information asymmetry: (1) informativeness of Financial Statement, is time-series adjusted-R^2 of model $P_{it} = a + b_1 E_{it} + b_2 BV_{it} + e_{it}$; (2) financial analyst following, the nature logarithm of one plus the number of analyst following the firm at fiscal year -1; (3) residual standard deviation is the dispersion in the market-adjusted daily stock returns in the year preceding the issuing convertible debt; (4) announcement reaction is standard deviation of the three-day cumulative abnormal returns around the announcements of quarterly earnings in five year period before the issuing convertible debt; (5) analyst forecast error are defined as the ratio of the absolute value of the difference between the actual earnings and the forecast earnings to the price per share at the beginning of the month. Discretionary current accrual (DCA) is extracted from current accruals by a within two-digit SIC industry cross-sectional modified Jones (1991) model. IAD is a dummy variable, which equals 1 for "High" information asymmetry and 0 otherwise. SGRO is computed as growth rate in sales from year 1 to year 3. CAPGRO is computed as change in capital expenditures from year 1 to year 3 scaled by lagged total assets. The numbers in parentheses are *t*-statistics. "***" represents a 1% significance level; "**" represents a 5% significance level; "*" represents a 10% significance level.

Dep. Var.	$\Delta NI / TA$		$\Delta EBIT / TA$		ΔROA	
Model	1	2	3	4	5	6
Panel A: Informativeness of Financial Statement						
Intercept	-0.017 (-0.69)	-0.055 (-2.69)***	-0.028 (-1.69)*	-0.043 (-2.70)***	-0.013 (-0.54)	-0.049 (-2.48)**
DCA	-0.263 (-2.29)**	0.060 (0.40)	-0.216 (-2.96)***	-0.040 (-0.35)	-0.263 (-2.33)**	0.010 (0.07)
DCA*IAD		-0.401 (-2.22)**		-0.231 (-1.67)*		-0.325 (-1.84)*
SGRO		-1.392 (-10.49)***		-0.542 (-5.37)***		-1.398 (-10.80)***
CAPGRO		-0.253 (-1.85)*		-0.091 (-0.87)		-0.230 (-1.72)*
N	183	183	177	177	183	183
Adjusted R^2	0.023	0.429	0.042	0.194	0.024	0.437
F-value	5.24**	35.18***	8.74***	11.57***	5.45**	36.36***
Panel B: Financial Analyst Following						
Intercept	-0.020 (-0.80)	-0.053 (-2.64)***	-0.030 (-1.82)*	-0.042 (-2.62)***	-0.016 (-0.65)	-0.048 (-2.46)**
DCA	-0.265 (-2.30)**	0.131 (0.95)	-0.221 (-3.01)***	0.002 (0.02)	-0.264 (-2.34)**	0.114 (0.85)
DCA*IAD		-0.549 (-3.14)***		-0.325 (-2.40)**		-0.519 (-3.06)***
SGRO		-1.383 (-10.55)***		-0.542 (-5.34)***		-1.389 (-10.89)***
CAPGRO		-0.264 (-1.96)*		-0.075 (-0.71)		-0.238 (-1.81)*
N	182	182	176	176	182	182
Adjusted R^2	0.023	0.445	0.044	0.205	0.024	0.456
F-value	5.31**	37.30***	9.05***	12.30***	5.50**	38.93***

Table 10 (continued)

Panel C: Residual Std. Dev.						
Intercept	-0.016 (-0.63)	-0.052 (-2.48)**	-0.029 (-1.72)*	-0.042 (-2.59)**	-0.012 (-0.48)	-0.047 (-2.31)**
DCA	-0.264 (-2.28)**	-0.002 (-0.01)	-0.225 (-3.01)***	0.018 (0.16)	-0.264 (-2.32)**	0.021 (0.15)
DCA*IAD		-0.322 (-1.77)*		-0.346 (-2.49)**		-0.357 (-2.03)**
SGRO		-1.385 (-10.28)***		-0.535 (-5.20)***		-1.389 (-10.63)***
CAPGRO		-0.287 (-1.95)*		-0.096 (-0.85)		-0.261 (-1.83)*
N	179	179	173	173	179	179
Adjusted R^2	0.023	0.425	0.045	0.207	0.024	0.440
F-value	5.18**	33.83***	9.08***	12.20***	5.38**	36.03***
Panel D: Financial Report Announcement Reaction						
Intercept	-0.011 (-0.32)	-0.077 (-3.25)***	-0.016 (-0.77)	-0.044 (-2.30)**	-0.004 (-0.11)	-0.068 (-3.00)***
DCA	-0.280 (-1.88)*	0.115 (0.78)	-0.237 (-2.58)**	0.007 (0.06)	-0.292 (-1.99)**	0.113 (0.79)
DCA*IAD		-0.387 (-1.96)*		-0.296 (-1.90)*		-0.401 (-2.11)**
SGRO		-1.843 (-11.89)***		-0.781 (-6.40)***		-1.853 (-12.39)***
CAPGRO		-0.242 (-1.54)		-0.091 (-0.74)		-0.217 (-1.44)
N	131	131	125	125	131	131
Adjusted R^2	0.019	0.575	0.044	0.320	0.022	0.595
F-value	3.53*	45.00***	6.67**	15.60***	3.94**	48.74***
Panel E: Analyst Forecast Error						
Intercept	-0.016 (-0.47)	-0.045 (-1.66)*	-0.029 (-1.55)	-0.037 (-2.04)**	-0.016 (-0.46)	-0.042 (-1.63)
DCA	-0.344 (-2.17)**	-0.112 (-0.66)	-0.206 (-2.46)**	-0.055 (-0.49)	-0.335 (-2.15)**	-0.094 (-0.58)
DCA*IAD		-0.143 (-0.61)		-0.192 (-1.24)		-0.156 (-0.70)
SGRO		-1.680 (-9.76)***		-0.552 (-4.87)***		-1.707 (-10.35)***
CAPGRO		-0.140 (-0.80)		-0.024 (-0.21)		-0.098 (-0.59)
N	122	122	118	118	122	122
Adjusted R^2	0.030	0.480	0.041	0.199	0.029	0.505
F-value	4.71**	28.94***	6.05**	8.27***	4.60**	31.85***