Earnings Management Surrounding New Debt Issues

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We examine whether firms manage earnings before issuing bonds to achieve a lower cost of borrowing. We find significant income-increasing earnings management prior to bond offerings. We also find that firms that manage earnings upward issue debt at a lower cost, after controlling for various bond issuer and issue characteristics. Our results are consistent with studies that report earnings management around equity issuance. The results indicate that, like equity holders, bondholders fail to see through the inflated earnings numbers in pricing new debt.

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1. Introduction

This study investigates two questions. Do firms engage in earnings management prior to public bond offerings? If so, how is the cost of debt, as measured by at-issue bond yield spreads, affected by the firms' earnings management?

Our study is motivated by compelling evidence in the literature that firms manage earnings around equity offerings and equity restructurings (Perry and Williams, 1994; Teoh, Welch, and Wong, 1998a, 1998b; Rangan, 1998; Shivakumar, 2000; DuCharme, Malatesta, and Sefeik, 2004). This line of research generally concludes that investors rely heavily on issuer-reported information in pricing a security. Firms could therefore potentially influence investors' perceptions about their financial situations by manipulating earnings upward or downward. Findings from prior research seem to indicate that equity investors are unable to undo the effect of pre-issue earnings management. In the case of IPOs and SEOs, investors overvalue equity with inflated earnings.

We propose that firms' incentives to manage earnings are not limited to equity offerings. U.S. firms rely heavily on debt financing. According to Thomson Financial SDC Platinum (SDC) (2005), the total value of straight corporate bond issues in 2004 was $1,278 billion. In contrast, common stock issues totaled $170 billion in value. Given the size of the bond market and the frequency of corporate bond issues, companies have incentives to manage earnings upward before issuing bonds as well.

Employing unexpected discretionary current accruals to represent the extent of earnings management, we find evidence that bond issuing firms inflate earnings prior to bond issues. Unexpected discretionary current accruals (DCAs) are significantly positive

in the year prior to bond offerings and are significantly higher than discretionary current accruals in the two years prior to the offerings.

More importantly, we find a significantly negative relation between yield spreads and pre-issue DCAs. The evidence suggests that firms that manage earnings upward enjoy lower costs of financing after controlling for other determinants of yield spreads. The relation is robust to alternative model specifications and control variables. Further examination reveals that pre-debt issue earnings management does not occur uniformly across all issuers. The inverse relation between yield spreads and DCAs exists primarily in smaller, younger, and Nasdaq-listed issuing firms; firms with weaker fundamentals seem to benefit more from pre-issue earnings management. In addition, pre-issue earnings management has a larger impact on bond yields in larger bond issues, issues with longer maturities, and those issued in high-volume markets.

Our paper makes two contributions. First, we expand prior research on earnings management into new territory and demonstrate that firms manage earnings not only around equity offerings but also surrounding bond issuances. Our findings suggest that earnings management prior to security issuance is more prevalent than previously reported. Second, our results shed light on additional factors that influence bond prices. We find that firms with inflated earnings appear able to issue bonds at a lower cost, *ceteris paribus*. Given the size and importance of the bond market, small changes in bond prices translate to large changes in capital allocation. Our study contributes to a better understanding of factors that influence bond prices and thus addresses a question of economic importance.

2. Testable hypothesis

2.1 Earnings management around corporate bond offerings

Healy and Wahlen (1999, P.368) define earnings management as follows: "Earnings management occurs when managers use judgment in financial reporting and in structuring transactions to alter financial reports to either mislead some stakeholders about the underlying economic performance of the company or to influence contractual outcomes that depend on reported accounting numbers."

Accrual-based accounting affords managers discretion in the reporting of earnings. Managers can report higher earnings without violating accounting rules in a variety of ways, such as shifting income from future periods to the present, accelerating the recognition of revenues, or deferring the recognition of certain expenses. Such earnings manipulation makes the reported earnings less informative to investors who rely on firm-reported information when assessing the "true" financial situation of a firm (Marquardt and Wiedman, 2004).

Several studies report large positive earnings and abnormal accruals prior to equity offerings followed by poor long-run post-issue earnings and stock return performance relative to the subjects' non-issuing industry peers (e.g., Teoh, Wong, and Rao, 1998; Teoh, Welch, and Wong, 1998a, 1998b; Rangan, 1998; Kim and Park, 2005). Investors appear to misinterpret high earnings reported at the time of equity offerings and consequently overvalue the new issues.

The proceeds from bond issuance tend to be large relative to total firm capital. Since shareholders gain if debt is issued at a lower cost, managers operating on behalf of shareholders may have an incentive to take actions which could result in a lower cost of

debt. Therefore, we hypothesize that income-increasing earnings management precedes bond issuance.

> *H_1: Firms engage in income-increasing earnings management prior to bond issuance.*

2.2 Earnings management and bond yield spreads

If companies manage their earnings upward prior to debt issuance, the next question is whether the inflated earnings actually lead to a reduced cost of debt. That is, do bondholders recognize that reported earnings have been inflated?

Recent research shows that the stock market incorrectly prices the information in operating accruals (Sloan, 1996) and that stock market participants are slow to unravel accounting manipulations (Coles, Hertzel, and Kalpathy, 2006). Similarly, bondholders could also fail to distinguish firms with high and low quality earnings, as shareholders do.[1] On the other hand, with institutional investors being the major players in the bond market, one might expect that these sophisticated institutions would be able to "read through the numbers." Therefore, how bond yields respond to the use of accruals is an empirical question.

We therefore hypothesize that if bondholders do not fully, or are slow to, understand the effects of earnings management, the income-increasing earnings management prior to bond offerings could lead to smaller bond yield spreads. In other words, larger discretionary accruals could lead to inflated earnings and result in a lower cost of debt.

[1] Both shareholders and bondholders rely heavily on public information provided by the issuer and may face similar levels of difficulty discerning firm quality (Demirtas, Ghosh, Rodgers, and Sokobin, 2006).

H_2: If the market does not fully understand the extent of earnings management, income-increasing earnings management at bond issuing firms may lead to a lower cost of debt.

3. Sample and methods

3.1 Sample selection

The sample consists of all nonconvertible bond issues by U.S. firms from 1970 to 2004 from the SDC New Issues database.[2] To be included, issues must meet the following criteria: 1) the company is listed on both Compustat and CRSP; 2) the company is not a regulated utility or financial institution (SIC codes 6000−6999 and 4900−4999); 3) if an issuing firm has multiple bond issues in a given year, we use issue proceeds as the weight and combine the multiple same-year issues into one observation to avoid spurious correlations (Anderson, Mansi, and Reeb, 2004; Klock, Mansi, and Maxwell, 2005); and 4) the issue has non-missing yield spreads from SDC. After applying these criteria, we obtain a sample of 4,999 bond offerings.

We examine firms' use of accruals in a five-year window surrounding bond issues. This means that if a firm has multiple issues during our sample period, we only retain the first observation during each five-year period to avoid the overlap of accrual estimation periods that can contain the downward reversal of the previous earnings management. Our final sample consists of 2,839 observations.[3] Table 1 provides the time distribution of our final sample.

[2] The SDC began a relatively comprehensive coverage of bond yield spreads in 1976. For earlier deals, we manually obtain the yield spread if the issue's yield to maturity is non-missing. Our main results continue to hold if we delete the bonds issued prior to 1976.

[3] The 2839 observations correspond to 1,571 different firms: 960 firms have only one bond issuance during the sample period; 296 firms have two issues; 133 firms have three issues; 83 firms have four issues; 50 firms have five issues; 37 firms have six issues; and 12 firms have seven issues.

−−−−− *Insert Table 1 about here* −−−−−

In some tests, we need to identify whether firms are involved in SEOs or M&As. We obtain information on SEOs from the SDC New Issues database. M&A information is obtained from the SDC Mergers & Acquisitions database.

3.2 Measuring discretionary accruals

Earnings management is often revealed by abnormal levels of accruals. The literature is in agreement that short-term accruals are more subject to management manipulation than long-term accruals. We calculate the unexpected discretionary current accruals (DCAs) using the modified Jones (1991) model.[4]

Current accruals (CA) are the adjustments of short-term assets and liabilities related to daily operations of the firm and are measured by the annual change in non-cash current assets (Compustat data2, data3, data68) minus the annual change in operating current liabilities (Compustat data70, data71, data72). Total current accruals is the sum of both discretionary and non-discretionary current accruals. To identify the non-discretionary component, we regress the current accruals on the change in sales from the previous year for all non-sample firms with the same two-digit Standard Industry Classification (SIC) codes, industry *j*, on Compustat for the year in question. To reduce heteroskedasticity, we deflate each variable in the model by the book value of total assets $TA_{j,t-1}$ (Compustat data6) from the prior year:

[4] Studies that employ a modified Jones model for abnormal accruals include Teoh, Welch, and Wong (1998a, 1998b); Rangan (1998); Hribar and Collins (2002); Xie, Davidson, and DaDalt (2003); Kim and Park (2005); Crutchley, Jensen, and Marshall (2007); Johnston and Madura (2009) and Chou, Gombola, and Liu (2006).

$$\frac{CA_{jt}}{TA_{j,t-1}} = \gamma_0 \frac{1}{TA_{j,t-1}} + \gamma_1 \frac{\Delta Sales_{jt}}{TA_{j,t-1}} \quad (1)$$

Using the estimates of γ_0 and γ_1, we estimate each sample firm's non-discretionary current accruals. The non-discretionary current accruals are the part of current accruals caused by a firm's sales growth and are "viewed as independent of managerial control" (Teoh, Welch, and Wong, 1998a).

We estimate the non-discretionary current accruals for firm *i* at time *t*, $NDCA_{it}$, as

$$NDCA_{it} = \hat{\gamma}_0 \frac{1}{TA_{i,t-1}} + \hat{\gamma}_1 \frac{\Delta Sales_{it} - \Delta AR_{it}}{TA_{i,t-1}} \quad (2)$$

AR represents the trade receivables (Compustat data151). We define the discretionary current accruals, DCA_{it}, as the remaining portion of the current accruals:

$$DCA_{it} = \frac{CA_{it}}{TA_{i,t-1}} - NDCA_{it} \quad (3)$$

Positive (negative) DCAs imply income increasing (decreasing) earnings management.

3.3 Measuring the cost of debt

Following prior literature, we define *Yield spread* as the difference between the at-issue yield spread of the bond and a comparable maturity U.S. Treasury bond, measured in basis points (Bhojraj and Sengupta, 2003; Ortiz-Molina, 2006; Jiang, 2008). SDC uses the rates on Treasury securities with the closest maturity to the sample bond issue. For example, if a bond matures in 11 years, the return on a 10-year Treasury bond is used as the benchmark. For bond issues with longer than a 30-year maturity, the 30-year Treasury bond rate is used as the benchmark. If a firm has multiple bond issues in a given

year, *Yield spread* is the average proceeds-weighted yield spread of all the issuances in the same year (Anderson, Mansi, and Reeb 2004; Klock, Mansi, and Maxwell, 2005).

3.4 Other control variables

In our multiple regressions, we control for both firm- and bond-specific variables. We include firm size, as measured by book value of total assets, since larger firms tend to be less risky and can enjoy a lower cost of debt. We use the accounting-based ratios of debt-to-assets (TotalLev) and return on assets (ROA) to proxy for firms' default risk. In addition, we include their capital intensity (Collateral) to account for differences in firms' asset structure; firms with greater capital intensity present lower risk to debt providers and are thus expected to have a lower cost of debt (Ashbaugh, Collins, and LaFond, 2006). We also control for the market-to-book ratio (Bhojraj and Sengupta, 2003; Nikolaev and Van Lent, 2005). Several recent studies argue that the level of equity valuation is likely related to the cost of debt (Jensen, 2005; Kothari, Loutskina, and Valeri, 2006; Chi and Gupta, 2008). We further control for firm risk by measuring the variance of the stock returns over the year prior to bond issuance (RetVar).[5] We measure all firm-specific variables at the fiscal year-end prior to the bond issue to ensure that the information is publicly available. To minimize the influence of outliers, we winsorize all firm-specific variables at the 1% and 99% levels.

[5] Specifically, TotalLev is equal to the total book value of debts over total assets. ROA is income before extraordinary items divided by total assets. We calculate M_B as the market value of assets over the book value of assets, where the market value of assets is the sum of market value of equity and book value of debt. Collateral is proxied by the ratio of gross property, plant, and equipment to total assets.

Bond-specific variables in the analysis include the total proceeds from the bond issue (Nikolaev and Van Lent, 2005), bond maturity, and bond ratings.[6] Again, we use the proceeds-weighted maturity or rating if a firm has more than one bond issue in a year (Anderson, Mansi, and Reeb, 2004; Klock, Mansi, and Maxwell, 2005).

We assign AAA bond ratings a value of 22 and D ratings a value of one (Klock, Mansi, and Maxwell, 2005). We focus on S&P credit ratings because Litov (2005) argues that the S&P ratings reflect the company's overall creditworthiness. In cases where the S&P ratings are missing but Moody's ratings are available (21 observations), we use Moody's ratings.

Finally, in the regressions, we control for time with dummy variables for each decade in the study (e.g., 1970s, 1980s, etc). We also control for industry with dummy variables based on two-digit SIC codes.

3.5 Descriptive statistics

Table 2 reports that bond issuers tend to be large firms, with average (median) sales of 4.8 (1.4) billion dollars and assets of 5.3 (1.4) billion dollars. However, there is considerable variation in firm size. Long-term debt appears to be an important source of financing for our sample firms. The mean (median) total debt ratio is 0.33 (0.29) while the long-term debt ratio is 0.27 (0.24). On average, our sample firms are profitable with an ROA of 4.42% and have a market-to-book ratio of about 1.50.

----- *Insert Table 2 about here* -----

[6] The results are robust if we measure firm size by the logarithm of sales, leverage by the long-term debt ratio, or profitability by cash flows from operation over assets. The results continue to hold if we replace bond maturities with durations.

Table 2 also reports that on average, the yield on bond issues in our sample exceeds that of the matched Treasury by 224 basis points. The mean yield spread for our sample firms is comparable to that in Mansi, Maxwell, and Miller (2005), whose sample firms have a mean yield spread of 245 basis points. The mean credit rating of 14 corresponds to an S&P rating between BBB− and BBB (or Moody's rating between Baa2 and Baa1). In our sample, the bond maturity averages 14 years, and the proceeds average 249 million dollars.

We report descriptive statistics on DCAs in Table 2. As shown in Table 2, the mean value of DCA as a percentage of lagged total assets in year −1 is 1.18%, with variations ranging from −2.31% at the 25th percentile to 3.61% at the 75th percentile.

Correlations, not reported in a table, are consistent with prior studies: yield spreads are positively related to leverage and return volatility and are negatively related to ratings, firm size, profitability, market-to-book, and collateral. More importantly for our purposes, DCAs are negatively related to *Yield spread*. There appears to be no significant correlation between DCAs and credit ratings.

4. Results

4.1 DCAs around corporate bond offerings

We report the intertemporal pattern of DCAs around bond offerings (Year 0) in Table 3. For the entire sample, there is no evidence of abnormal use of accruals two years prior to bond issues (t = −0.05). At the end of the fiscal year prior to the bond issues (Year −1), DCAs become positive and are significant at the 1% level (t = 5.62). We also compute the change in the DCA between years by subtracting the DCA in one year from

the next year. The change in DCA from Year −2 to Year −1 is highly significant at the 1% level. DCAs remain positive and are significant at the 1% level during the issue year (t = 4.37). Subsequent to bond offerings, the level of DCAs gradually drops toward zero (t = 0.26 for Year 2). The pattern continues to exist in various subsamples partitioned by the issuing firms' credit ratings, market capitalization, firm performance (ROA), and earnings volatility.[7] The increase in DCAs immediately prior to bond issues and the subsequent mean reversion toward zero is consistent with issuers engaging in pre-issue income-increasing earnings management activities.

----- *Insert Table 3 about here* -----

The magnitude of DCAs around bond offerings (1.18% in Year −1 and 0.98% in Year 0) is much smaller than corresponding findings prior to seasoned equity offerings (5.37% in Teoh, Welch, and Wong, 1998b) and during the IPO issue year (9.95% in Teoh, Welch, and Wong, 1998a). Thus, the extent of earnings management seems to depend on the type of issuing securities under consideration.

4.2 Bond yield spreads and DCAs

Our results suggest that there is income-increasing earnings management prior to bond issues. The next and perhaps more important question is to determine whether bondholders fully understand that earnings have been inflated and whether they price debt accordingly. To address this question, we first partition the full sample of firms into four quartiles based on their pre-issue DCAs. Firms in the top (bottom) quartile are considered to have the most aggressive (conservative) use of accruals. In untabulated

[7] The evidence here is consistent with prior findings in the equity market that firms often do not want to reverse the managed earnings immediately after capital-raising activities. For example, Teoh, Welch, and Wong (1998) report high DCA in year 0 and year 1 (4.01 vs. 2.24), as well. So, the relatively large DCA for the non-investment grade subsample and the large ROA sample at time 0 simply suggests that these firms, perhaps due to caution, choose to delay the reversal of their accrual management.

results, the mean value of bond yield spreads for the aggressive group is 217.91, which is significantly lower than the 247.58 mean value for the conservative group. The univariate evidence appears to suggest that there is a lower cost of debt for the group of firms with aggressive pre-issue DCAs.

We estimate a regression model with *Yield spread* as the dependent variable and DCAs in Year −1 as an independent variable. If a negative relation between DCAs and *Yield spread* occurs, this result would suggest that the cost of a bond is lower as earnings are inflated and that bondholders are unable to distinguish between firms with good earnings quality and those where earnings quality is poor. In contrast, if we find no relation between DCAs and *Yield spread*, this would imply that bondholders recognize and incorporate the positive accruals in their assessment of the firm, and there would be no effect on the cost of debt.

Following Anderson, Mansi, and Reeb (2004), we control for pre-issue firm-specific and issue-specific characteristics, including firm size (*Log assets*), profitability (*ROA*), financial leverage (*TotalLev*), firm risk (*RetVar*), bond maturity (*Log maturity*), and bond credit ratings (*Rating*). In addition, our model includes growth opportunities (*M_B*), the size of bond issues (*Log proceeds*) (Bhojraj and Sengupta, 2003; Nikolaev and Van Lent, 2005), and property, plant, and equipment to total assets (*Collateral*) (Ashbaugh, Collins, and LaFond, 2006) because they are also likely to affect the cost of bond financing. We also control for industry and time in the regressions (the estimated coefficients are not shown in the table).

A potential problem with raw credit ratings is that they may have already incorporated the information from some of the control variables. To avoid potential

collinearity problems, we use an estimate of the bond credit ratings instead of the raw measures (Ashbaugh, Collins, and LaFond, 2006). Specifically, we estimate a model for credit ratings with *Log assets, ROA, TotalLev, RetVar, Log maturity, M_B, Collateral,* and *Log proceeds*. The error term from this regression contains rating information net of the impact of these control variables. We label the error term as the credit rating variable in subsequent analysis.

----- *Insert Table 4 about here* -----

Table 4 contains the regression results. For the entire sample (model 1), the estimated coefficient for DCA is negative and significant (t = −2.00), which means the pre-issue earnings manipulation by issuing firms lowers the cost of debt financing. This evidence is consistent with the notion that bondholders do not realize that the reported earnings are higher than can be justified by actual cash flows. As a result, the bondholders charge a lower rate on bonds issued by firms with more aggressive earnings management.

We also find that lower bond yield spreads are associated with larger firm size (t = −21.57), higher ROAs (t = −8.38), lower debt ratios (t = 9.49), greater growth opportunities (t = −5.05), smaller stock return volatility (t = 15.85), higher percentages of fixed assets over total assets (t = −2.70), smaller issue proceeds (t = 9.48), and longer maturity (t = −3.55). The influences of these firm-specific variables on bond yield spreads are consistent with prior studies. Bond credit ratings are strongly and inversely related to yield spreads (t = −25.24), indicating that the higher the bond rating, the lower the default risk and therefore the lower the yield spread.

To examine whether the results are driven by industry and time effects, we add industry and time dummy variables to the regression (Table 4, model 2). The estimated coefficient for DCA retains its negative sign and its statistical significance (t = −2.41). Therefore, our results are robust to industry and time effects.

We conduct several robustness tests. First, Teoh, Welch, and Wong (1998b) find evidence of earnings management prior to seasoned equity offerings (SEOs). To ensure that our findings do not simply capture the pre-SEO earnings management effect, we exclude 255 firms that conduct SEOs during the same year as the debt issues, and we re-estimate our model. The results (Table 4, model 3) confirm that the results for models 1 and 2 are not driven by SEO firms. The estimated coefficient for DCA is still negative (t = −2.23). Second, Erickson and Wang (1999) show that acquiring firms manage earnings upward prior to stock-for-stock mergers. To address the concern that our findings might be contaminated by firm merger activities, we delete the issuers involved in stock-for-stock mergers during the same year as the debt offerings. The results (model 4) are qualitatively similar to the previous models. Therefore, we conclude that bond issuers engage in earnings management prior to debt offerings and that such income-increasing earnings management practices result in lower costs of bond financing.[8]

4.2.1 Economic significance of discretionary accruals

One standard deviation increase in DCA leads to a decrease of about 4.875 basis points. The interest payment savings per year for an issue of average size is 0.12 million (249.42*4.875 basis points). The average maturity of bond issues is 13.69 years. Using a

[8] One drawback of using accruals from the modified Jones model is that if bond issues are positively correlated with firms' M&A activities, then this would induce an upward bias in the accruals estimates (Hribar and Collins, 2002). To address this concern, we re-estimate our equations excluding all firms involved in M&A activities (240 firms) in the year of the bond issues. Our results continue to hold.

discount rate equal to the sum of the average 10-year Treasury rate over the sample period (7.75%) and the average sample yield spread of 224.20 basis points, a savings of 0.12 million over 14 years translates into a present value of one million dollars. While the magnitude of earnings management at debt issues is smaller than that at IPOs and SEOs, debt issues are much more frequent than equity issues and therefore earnings management before debt issues can still be economically meaningful.

4.3 Endogeneity issue

If there were any endogeneity in decision making with regards to the pricing of debt and earnings management, our results would be biased. In this section, we estimate a system of simultaneous equations using 2SLS. In the first equation, *Yield spread* is the dependent variable. In the second equation, DCA is the dependent variable. We include control variables in each regression. We follow Kim and Park (2005) in constructing instruments for DCAs. In particular, we use two instruments. AA is the absolute value of total accruals. B6 is a dummy variable equal to one if the firm's auditor is one of the six largest accounting firms. Becker, DeFond, Jiambalvo, and Subramanyam (1998) provide empirical evidence that high quality auditors tend to deter earnings management. Further, they report a negative relation between discretionary accruals and the absolute value of total accruals. As evident from Table 5, DCAs negatively affect *Yield spread* while *Yield spread* appears to have no effect on DCAs. From Table 5, we conclude that our finding of higher DCAs associated with lower costs of debt is robust to endogeneity concerns.

-----*Insert Table 5 About Here*-----

4.4 Non-uniformity of the relation between Yield spread and DCAs

In the following sections, we examine whether the relation between *Yield spread* and DCAs differs for bonds with distinct issue or issuer characteristics. This non-uniformity is intriguing because several studies suggest that the post-issue long-term stock underperformance is a function of issue and issuer characteristics. For example, Spiess and Affleck-Graves (1999) report that stocks suffer underperformance after debt issues. The long-run post-issue underperformance is particularly severe for smaller, younger, and Nasdaq-listed firms, for firms issuing speculative grade debt, and for bonds issued in high-volume markets. Loughran and Ritter (1995) and Spiess and Affleck-Graves (1995) provide similar findings for corporate equity issuances. To the extent that the significant long-run post-issue underperformance by firms that issue straight bonds can be a result of the subsequent reversal of the issuers' earnings manipulations prior to debt offerings, we expect the relation between *Yield spread* and DCAs to be a function of issue or issuer characteristics as well.

4.4.1 Yield spreads and DCAs by bond issue characteristics

We explore whether the inverse relation between corporate bond *Yield spread* and DCAs varies with deal-specific characteristics. In their study of earnings management around SEOs, Kim and Park (2005) argue that issuers have an incentive to boost earnings to increase their offering proceeds. This may also be the case for debt issues. We first partition the sample by issue size relative to the size of the company's assets. If managers adjust earnings to reduce the cost of debt, then the savings in the cost of debt due to earnings management can be greater in larger issues than in smaller ones. Therefore, we

expect the inverse relation between *Yield spread* and DCAs to be more pronounced in larger issues.

-----Insert Table 6 about here -----

The results are in Table 6. The evidence for model 1 supports our argument. In smaller issues, defined as those with proceeds below the sample median (issue size/assets), we find little or no evidence that accruals affect debt pricing. However, we find a strong relation between yield spreads and current accruals in large issues ($t = -2.80$). Thus, earnings management is more likely to result in lower yield spreads when the size of a bond issue is relatively large.

We further split our sample into short-maturity (less than five years) versus long-maturity issues. With longer-term debt, firms would pay a lower cost for a longer period of time. Therefore, firms may have stronger incentives for earnings management in long-maturity bond issues.

Consistent with our hypothesis, the estimated coefficient for DCA (Table 6, model 2) is negative and significant only for the long-maturity bond issues ($t = -2.79$). We re-estimate our models for bonds with maturities of fewer than seven years and again for those with fewer than 10 years and obtain qualitatively similar results. Hence, our evidence supports the view that inflated earnings have a stronger impact on the cost of debt in longer-term bond issues.

Spiess and Affleck-Graves (1999) point out that the "hotness" of the new-issue market plays an important role in explaining post-debt issue underperformance. In light of their findings, we partition our sample into high- and low-volume issues. We define high-volume issues as those that occur during a year in which the total number of non-

convertible bond issues is greater than or equal to the median number of issues per year during our entire sample period. If the "hotness" of the bond market is associated with loose credit terms or bond investors' greater willingness to invest, then we expect stronger incentives on the part of bond issuers to take advantage of the favorable market conditions in high-volume periods via earnings management. It may also be the case that less scrutiny from the bond market makes earnings manipulation a more feasible strategy.

As model 3 in Table 6 shows, the inverse relation between bond yield spreads and current accruals exists only in "hot" market issues (t = −2. 33). The finding is consistent with the view that issuing firms have greater leeway to manipulate earnings in "hot" markets. In sum, we find that the inverse relation between *Yield spread* and DCAs exists primarily in issues that are larger, have longer maturities, and are issued in the high-volume markets.

4.4.2 Yield spreads and DCAs by bond issuer characteristics

In this section, we explore how the inverse relation between *Yield spread* and DCAs differs across bond issuer characteristics. Prior literature (Schipper, 1989; Jo and Kim, 2007) suggests that asymmetric information makes it possible for managers to manage earnings. It may be particularly difficult for investors to ascertain the extent of earnings manipulation in firms with opaque information environment.

Smaller and Nasdaq-listed firms may be more likely to face information asymmetry. For example, Carvell and Strebel (1987) argue that there are neglected firms, those with less analyst coverage. These firms tend to be smaller and have larger betas than those covered by analysts. Does this lead to greater opportunities for earnings management? The evidence in Li, Zhang, and Zhou (2005) suggests so. Specifically,

they find that in the context of IPOs, firms associated with the most aggressive earnings management are generally smaller and less recognized firms. They also contend that these firms likely have weaker fundamentals and that lower-quality firms benefit more from earnings management. Frider and Suk (2006) find that NYSE firms have greater earnings information disclosures than Nasdaq firms. In addition, Yoon (2005) demonstrates that firms listed on the Korean Stock Exchange engage in less earnings management than those listed on KOSDAQ, a Korean market similar to Nasdaq. As a direct measure of information asymmetry, we use the probability of informed trading (PIN) developed in Easley, Hvidkjaer and O'hara (2002).[9] This variable is derived from a firm's microstructure characteristics and provides an estimate of the level of private information associated with a firm's stock.

Greater information asymmetry may lead to opportunities for small, Nasdaq firms and firms with higher PINs to engage in earnings management prior to debt issues.[10] We therefore divide our sample firms into two groups based on firm size, two groups based on whether or not the issuing firms traded on Nasdaq, and two groups based on PINs.

----- *Insert Table 7 about here* -----

Consistent with our conjecture, Table 7 shows that the significant and negative association between *Yield spread* and DCAs is present only in Nasdaq-listed firms ($t = -2.74$), small issuers ($t = -2.56$), and firms with greater PINs ($t = -3.18$). It does appear that the smaller, Nasdaq listed firms and firms with greater information asymmetry are

[9] We thank Professor Soern Hvidkjaer (University of Maryland) for providing PINs for the period 1983-2001. For more recent periods, we replenish PINs with data provided by Professor Stephen Brown at Emory University.

[10] Kim and Park (2005) argue that large firms are more politically sensitive than small firms and that their earnings management is more likely to be detected (Zmijewski and Hagerman, 1981; Watts and Zimmerman, 1978).

driving our results. So, while we find evidence, on average, of earnings management prior to debt issues, it does not appear as though it extends to the entire market.

5. Conclusions

This study provides evidence of income-increasing earnings management prior to corporate bond issues. Using 2,839 non-convertible bond issues from the period between 1970 and 2004, we find positive and significant unexpected discretionary current accruals (a proxy for earnings management) prior to bond issues.

More importantly, we find that the observed abnormal accruals are negatively related to the cost of bond financing when controlling for firm- and issue-specific characteristics. This finding is robust to different model specifications, alternative measures of earnings management, and other control variables. Further, the inverse relation between abnormal accruals and bond yield spreads does not occur uniformly; it primarily exists in bonds issued by smaller and Nasdaq-listed firms and in bond issues that are larger, have longer maturity, and are issued in high-volume markets.

The evidence that income-increasing earnings management leads to lower costs of debt financing suggests that bondholders are unable to unravel the inflated earnings numbers in pricing new debt. Our study extends previous research by illustrating that firm earnings management not only exists in equity offerings (Teoh, Wong, and Rao, 1998; Teoh, Welch, and Wong, 1998a, 1998b; Rangan, 1998; Kim and Park, 2005), but in bond offerings as well. Given the large total value of the bond market and the high frequency of bond issues, our study fills an important void in the literature.

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Table 1: Bond issues by years: 1970-2004

Our sample consists of all nonconvertible bond issues by U.S. firms from 1970 to 2004 satisfying the following: 1) the company is listed on both Compustat and CRSP; 2) the company is not a regulated utility or financial institution (SIC codes 6000−6999 and 4900−4999); 3) if an issuing firm has multiple bond issues in a given year, we use issue proceeds as the weight and combine the multiple same-year issues into one observation to avoid spurious correlations; 4) the issue has non-missing yield spreads from the SDC. If a firm has several issues during our sample period, we only retain a one-year observation for each five-year period .Our final sample contains 2,839 firm-year observations

Issue year	# of firms	% of firms in the sample
1970	124	4.37%
1971	90	3.17%
1972	30	1.06%
1973	13	0.46%
1974	29	1.02%
1975	109	3.84%
1976	53	1.87%
1977	40	1.41%
1978	54	1.90%
1979	54	1.90%
1980	96	3.38%
1981	47	1.66%
1982	60	2.11%
1983	71	2.50%
1984	68	2.40%
1985	151	5.32%
1986	172	6.06%
1987	103	3.63%
1988	62	2.18%
1989	51	1.80%
1990	50	1.76%
1991	101	3.56%
1992	139	4.90%
1993	180	6.34%
1994	71	2.50%
1995	120	4.23%
1996	121	4.26%
1997	119	4.19%
1998	113	3.98%
1999	83	2.92%
2000	37	1.30%
2001	84	2.96%
2002	64	2.25%
2003	52	1.83%
2004	28	0.99%
Total	2839	100.00%

Table 2: Descriptive statistics

Our sample contains 2,839 firm-year observations. *Sales* is the net sales in million dollars; *Assets* is the total book value of assets in million dollars; *ROA* is calculated as income before extraordinary item over total assets; *TotalLev* is total book debt over total assets; *LtLev* is the long-term debt over total assets; *M_B* is the market value of assets divided by the book value of assets; *Collateral* is PPE over total assets. All firm characteristic variables are measured at the fiscal year-end prior to the bond issues. *RetVar* is the variance of stock returns over one year prior to bond issuance. *Yield spread* is the number of basis points of the issue's yield spread over the comparable maturity Treasury. *Rating* refers to the bond's credit rating. *Maturity* is the number of years bonds are outstanding. *Proceeds* from the bond issue are measured in million dollars. The bond characteristic variables are proceeds-weighted if a firm has multiple issues in a given year. *DCA* is the discretionary current accruals at the fiscal year-end before debt issues. DCA is calculated following Teoh, Welch, and Wong (1998a) and is reported as a percentage of lagged total assets.

	Mean	Standard deviation	25th percentile	Median	75th percentile
Firm characteristics					
Sales	4,792.71	12,045.56	373.05	1,412.45	4,160.60
Assets	5,322.43	19,477.65	393.53	1,364.93	4,066.13
ROA (%)	4.42	8.41	2.42	4.97	7.39
TotalLev	0.33	0.19	0.20	0.29	0.42
LtLev	0.27	0.19	0.14	0.24	0.37
M_B	1.50	0.73	1.05	1.29	1.67
RetVar	6.14	5.19	2.67	4.40	7.85
Collateral	0.70	0.36	0.43	0.67	0.96
Issue characteristics					
Yield spread	224.20	172.52	89.00	157.00	336.25
Rating	13.77	4.60	9.00	14.34	17.00
Maturity	13.69	7.73	8.88	10.00	19.98
Proceeds	249.42	451.30	60.00	124.30	249.40
Statistics on accruals					
DCA	1.18%	9.80%	-2.31%	0.25%	3.61%

Table 3: Discretionary current accruals around bond offerings

Year 0 is the year of bond offerings. Discretionary current accruals (DCAs) are calculated using the modified Jones (1991) model. *Rating* is the proceeds-weighted numerical S&P credit rating. *ROA* is income before extraordinary items over total assets. *Firm size* is measured by the issuer's market value of equity. *Earnings volatility* is the standard error of earnings before extraordinary items for the past five years prior to bond issues. *t*-statistics are in parenthesis.

	Year -2	Year -1	Year 0	Year 1	Year 2	Year -1 vs. Year -2	Year 0 vs. Year -1
Panel A: Full sample							
Full sample	-0.09%	1.18%	0.98%	0.30%	0.05%	1.14%	-0.00%
	(-0.05)	(5.62)***	(4.37)***	(1.72)*	(0.26)	(5.34)***	(-0.65)
Panel B: Subsamples by bond ratings							
Investment bonds	-0.15%	1.22%	0.43%	-0.19%	-0.23%	1.44%	-0.71%
	(-0.87)	(5.98)***	(2.17)**	(-1.16)	(-1.18)	(5.35)***	(-2.38)**
Non-investment bonds	0.04%	1.11%	1.92%	1.12%	0.56%	1.33%	0.77%
	(0.09)	(2.39)**	(3.82)***	(3.10)***	(1.55)	(2.31)**	(1.15)
Panel C: Subsamples by firm size							
Small issuers	0.11%	1.84%	1.63%	0.52%	0.26%	1.79%	-0.16%
	(0.35)	(5.06)***	(4.28)***	(1.71)*	(0.91)	(3.94)***	(-0.30)
Large issuers	-0.21%	0.88%	0.36%	-0.04%	-0.27%	1.16%	-0.54%
	(-1.05)	(3.60)***	(1.53)	(-0.18)	(-1.17)	(3.58)***	(-1.53)
Panel D: Subsamples by firm ROA							
Low ROA firms	0.09%	0.78%	0.00%	0.11%	-0.35%	1.04%	-0.76%
	(0.33)	(2.31)**	(0.00)	(0.48)	(-1.43)	(2.67)***	(-1.67)*
High ROA firms	-0.23%	1.51%	1.88%	0.42%	0.35%	1.70%	0.29%
	(-0.99)	(5.88)***	(6.07)***	(1.72)*	(1.40)	(4.76)***	(0.73)
Panel E: Subsamples by firm earnings volatility							
Low earnings volatility firms	0.20%	1.71%	1.69%	0.67%	0.48%	1.79%	0.14%
	(0.55)	(3.99)***	(3.64)***	(1.98)**	(1.49)	(3.39)***	(0.22)
High earnings volatility firms	-0.23%	0.90%	0.52%	0.06%	-0.23%	1.21%	-0.37%
	(-1.28)	(3.96)***	(2.43)**	(0.33)	(-1.14)	(4.13)***	(-1.17)

Significance at the 10%, 5% and 1% levels is indicated by *, ** and ***, respectively.

Table 4: Regressions of yield spreads on discretionary current accruals

This table reports the regression results of *Yield spread* on discretionary current accruals and other control variables. *DCA* is the discretionary current accruals measured at the fiscal year-end prior to bond issues using the modified Jones (1991) model. *Log assets* is the log of total assets; *ROA* is income before extraordinary items over total assets; *TotalLev* is total book debt over total assets; *M_B* is the market value of assets divided by the book value of assets; *Collateral* is PPE over total assets. All firm characteristic variables are measured at the fiscal year-end prior to the bond issues. *RetVar* is the variance of stock returns over one year prior to bond issuance. *Log proceeds* is the log of total proceeds of the bond issue. *Log maturity* is the log of the number of years that bonds are outstanding. Both *Log proceeds* and *Log maturity* are proceeds-weighted if a firm has more than one bond issue in a year. *Rating* is the proceeds-weighted numerical credit ratings orthogonalized to other control variables in the regression. Dependent variable is the proceeds-weighted bond yield spreads. Coefficients for intercepts, industry dummies (two-digit SICs) and time period dummies (70s, 80s and 90s) are omitted. *t*-statistics (reported in parenthesis) are based on standard errors clustered by firms.

	Model 1	Model 2	Model 3	Model 4
	Entire sample	Entire sample	Excluding SEO firms	Excluding firms involved in stock mergers
DCA	**-49.77****	**-55.95****	**-55.07****	**-59.36****
	(-2.00)	**(-2.41)**	**(-2.23)**	**(-2.52)**
Log assets	-46.63***	-47.33***	-48.63***	-47.19***
	(-21.57)	(-21.66)	(-21.38)	(-21.40)
ROA	-553.24***	-619.28***	-653.99***	-613.69***
	(-8.38)	(-8.84)	(-8.57)	(-8.56)
TotalLev	161.82***	157.12***	143.00***	160.03***
	(9.49)	(8.98)	(7.56)	(8.93)
M_B	-17.70***	-17.06***	-14.85***	-16.46***
	(-5.05)	(-4.50)	(-3.52)	(-4.20)
RetVar	1,131.75***	1,121.54***	1,119.35***	1,114.47***
	(15.85)	(14.61)	(15.00)	(14.22)
Collateral	-18.23***	-17.65**	-13.53	-16.84*
	(-2.70)	(-2.05)	(-1.52)	(-1.92)
Log proceeds	26.29***	26.88***	27.71***	26.53***
	(9.48)	(9.77)	(9.85)	(9.46)
Log maturity	-14.09***	-12.85***	-10.77***	-13.73***
	(-3.55)	(-3.11)	(-2.79)	(-3.26)
Rating	-23.52***	-23.60***	-23.34***	-23.66***
	(-25.24)	(-24.78)	(-24.08)	(-24.46)
Industry & time dummies	NO	YES	YES	YES
N	1,682	1,682	1,509	1,630
R^2	72%	75%	75%	75%

Significance at the 10%, 5% and 1% levels is indicated by *, ** and ***, respectively.

Table 5: Simultaneous equation model: 2SLS estimation results

DCA is the discretionary current accruals measured at the fiscal year-end prior to bond issues using the modified Jones (1991) model. *Log assets* is the log of total assets; *ROA* is income before extraordinary item over total assets; *TotalLev* is total book debt over total assets; *M_B* is the market value of assets divided by the book value of assets; *Collateral* is PPE over total assets. All firm characteristic variables are measured at the fiscal year-end prior to the bond issues. *RetVar* is the variance of stock returns over one year prior to bond issuance. *Log proceeds* is the log of total proceeds of the bond issue. *Log maturity* is the log of the number of years that bonds are outstanding. Both *Log proceeds* and *Log maturity* are proceeds-weighted if a firm has more than one bond issue in a year. *Rating* is the proceeds-weighted numerical credit ratings orthogonalized to other control variables in the regression. *AA* is the absolute value of total accruals. *B6* is a dummy equal to one if the firm's auditor is one of the six largest accounting firms.

Dependent variable	Yield spread	DCA
DCA	**-285.93****	
	(-2.08)	
*Yield spread(*10^3)*		-0.02
		(-0.74)
Log assets	-46.50***	-0.01***
	(-22.15)	(-3.08)
ROA	-516.17***	
	(-9.66)	
TotalLev	175.40***	
	(10.94)	
M_B	-18.23***	
	(-5.72)	
RetVar	1,114.02***	-0.02
	(21.09)	(-0.25)
Collateral	-24.31***	
	(-3.49)	
Log proceeds	25.06***	
	(8.11)	
Log maturity	-13.91***	
	(-3.58)	
Rating	-23.41***	
	(-28.16)	
AA		-0.16***
		(-7.46)
B6		-0.00
		(-0.12)
Intercept	400.46***	0.07***
	(20.91)	(4.53)
R^2	70.61%	3.45%

Significance at the 10%, 5% and 1% levels is indicated by *, ** and ***, respectively.

Table 6: Regressions of yield spreads on DCAs by issue size, maturity and market state

DCA is the discretionary current accruals measured at the fiscal year-end prior to bond issues using a modified Jones (1991) model. Small (Large) issues have issue proceeds (relative to book value of assets) below (above) the median issues in the sample. Short (Long) maturity issues have years to maturity fewer (more) than five. Issues in low− (high−) volume markets are those that occur during a year in which the total number of non-convertible bond issues is below (above) the median number of issues per year for the period from 1970 to 2004. *Log assets* is the log of total assets; *ROA* is calculated as income before extraordinary items over total assets; *TotalLev* is total book debt over total assets; *M_B* is the market value of assets divided by the book value of assets; *Collateral* is PPE over total assets. All firm characteristic variables are measured at the fiscal year-end prior to the bond issues. *RetVar* is the variance of stock returns over one year prior to bond issuance. *Log proceeds* is the log of total proceeds of the bond issue. *Log maturity* is the log of the number of years bonds are outstanding. Both *Log proceeds* and *Log maturity* are proceeds-weighted if a firm has more than one bond issue in a year. *Rating* is the proceeds-weighted numerical credit ratings orthogonalized to other control variables in the regression. The dependent variable is the proceeds-weighted yield spread. Coefficients for intercepts, industry dummies (two-digit SICs) and time period dummies (70s, 80s and 90s) are omitted. *t*-statistics (in parenthesis) are based on standard errors clustered by firms.

	Model 1		Model 2		Model 3	
	Small issue size	Large issue size	Short maturity issues	Long maturity issues	Issues in low-volume market	Issues in high-volume market
DCA	9.17	-91.08***	153.59	-67.38***	-37.77	-62.86**
	(0.35)	(-2.80)	(1.34)	(-2.79)	(-0.81)	(-2.33)
Log assets	-28.83***	-65.47***	-19.37	-47.94***	-41.67***	-49.99***
	(-8.41)	(-10.95)	(-1.13)	(-20.79)	(-10.49)	(-18.79)
ROA	-489.45***	-737.21***	-586.85	-611.32***	-372.33***	-678.17***
	(-4.74)	(-8.24)	(-1.32)	(-9.05)	(-3.19)	(-8.06)
TotalLev	152.86***	157.85***	-64.49	160.92***	166.60***	165.21***
	(6.11)	(6.83)	(-0.40)	(9.02)	(5.14)	8.28)
M_B	-10.95**	-22.37***	-22.70	-20.05***	-10.41	-17.34***
	(-2.12)	(-4.22)	-0.98)	(-5.28)	(-1.39)	(-3.79)
RetVar	1,051.42***	1,058.23***	2,211.18***	1,113.62***	743.35***	1,260.04***
	(9.33)	(9.97)	(3.85)	(14.13)	(7.84)	(12.15)
Collateral	-19.35*	-15.23	6.21	-20.32**	-32.98**	-12.30
	(-1.70)	(-1.26)	(0.13)	(-2.28)	(-2.42)	(-1.22)
Log proceeds	14.56***	41.94***	10.73	27.78***	24.56***	23.51***
	(3.73)	(5.73)	(1.00)	(9.41)	(4.00)	(7.47)
Log maturity	3.12	-32.21***	-43.23	-9.42***	6.24	-16.45***
	(0.64)	(-3.95)	(-0.95)	(-2.36)	(1.13)	(-3.03)
Rating	-18.61***	-27.41***	-5.04	-23.79***	-21.13***	-27.21***
	(-12.95)	(-19.51)	(-0.48)	(-25.38)	(-14.58)	(-21.19)
N=	894	788	71	1611	529	1153
R^2	60%	77%	63%	77%	77%	78%

Significance at the 10%, 5% and 1% levels is indicated by *, ** and ***, respectively.

Table 7: Regressions of yield spreads on DCAs by listing, issuer size and PIN

DCA is the discretionary current accruals measured at the fiscal year-end prior to bond issues using a modified Jones (1991) model. Nasdaq (Non-Nasdaq) firms are issuers which are (are not) listed on Nasdaq. Small (Large) issuers have market value of equity below (above) median firm in the sample. PIN is the probability of informed trading developed in Easley, Hvidkjaer, and O'hara. *Log assets* is the log of total assets; *ROA* is income before extraordinary items over total assets; *TotalLev* is total book debt over total assets; *M_B* is the market value of assets divided by the book value of assets; *Collateral* is PPE over total assets. All firm characteristic variables are measured at the fiscal year-end prior to the bond issues. *RetVar* is the variance of stock returns over one year prior to bond issuance. *Log proceeds* is the log of total proceeds of the bond issue. *Log maturity* is the log of the number of years bond are outstanding. Both *Log proceeds* and *Log maturity* are proceeds-weighted if a firm has more than one bond issue in a year. *Rating* is the proceeds-weighted numerical S&P credit ratings, orthogonalized to other control variables in the regression. Dependent variable is the proceeds-weighted yield spread. Coefficients for intercepts, industry dummies (two-digit SICs) and time period dummies (70s, 80s and 90s) are omitted. *t*-statistics (in parenthesis) are based on standard errors clustered by firms.

	Model 1		Model 2		Model 3	
	Nasdaq firms	Non-Nasdaq firms	Small issuers	Large issuers	Low PIN	High PIN
DCA	-70.62***	28.81	-90.70**	-6.28	8.65	140.11***
	(-2.74)	(0.57)	(-2.56)	(-0.25)	(0.17)	(-3.18)
Log assets	-47.05***	-47.91***	-51.74***	-27.52***	-35.37***	-52.87***
	(-18.23)	(-10.68)	(-11.50)	(-9.62)	(-7.76)	(-12.47)
ROA	-608.88***	-683.39***	-637.85***	-532.75***	-591.34***	-673.40***
	(-7.67)	(-4.54)	(-6.32)	(-5.46)	(-3.83)	(-5.61)
TotalLev	168.88***	107.05***	177.81***	87.57***	119.47***	179.23***
	(8.66)	(2.69)	(6.87)	(4.35)	(3.33)	(6.63)
M_B	-17.90***	-12.31	-34.78***	-8.85***	-19.34***	-33.06***
	(-4.20)	(-1.46)	(-3.70)	(-2.18)	(-3.65)	(-3.29)
RetVar	1,196.33***	754.35***	1,084.82***	1,072.45***	1,101.67***	1,023.83***
	(12.87)	(6.28)	(11.71)	(7.25)	(4.83)	(9.03)
Collateral	-14.80*	-23.10	-33.06**	-5.59	-1.27	-7.92
	(-1.50)	(-1.30)	(-2.45)	(-0.55)	(-0.06)	(-0.54)
Log proceeds	25.59***	26.44***	31.72***	16.45***	18.60***	30.28***
	(7.98)	(3.92)	(5.25)	(5.62)	(3.64)	(5.96)
Log maturity	-14.73***	-11.47*	-21.00***	-4.40	-14.61**	-17.44
	(-3.01)	(-1.68)	(-2.63)	(-0.91)	(-1.99)	(-2.34)***
Rating	-24.04***	-24.70***	-27.77***	-16.92***	-24.06***	-26.42***
	(-20.37)	(-14.10)	(-19.73)	(-12.44)	(-10.01)	(-15.73)
N=	1,223	459	717	945	769	671
R^2	75%	80%	75%	58%	68%	77%

Significance at the 10%, 5% and 1% levels is indicated by *, ** and ***, respectively.