Real Earnings Management Activities Prior to Bond Issuance

Abstract

We examine real activities manipulation by firms prior to their debt issuances and how such manipulation activities affect bond yield spreads. We find that bond-issuing firms ramp up their real activities manipulation in the five quarters leading to the bond issuances. Interestingly, we document a negative relationship between yield spread and pre-issue real activities manipulation; firms that engage in more real activities manipulation can issue debts at lower costs. Thus, bondholders fail to see through the real activities manipulation in pricing new debts. Since real activities manipulation affects firm future cash flows and subsequently its solvency capability, it is critical that bondholders have the incentives and the capability to look into real activities manipulation and a corresponding yield is applied.

Keywords: Real activities manipulation, debt issues, earnings management.

JEL Classification: G32, G34

1. Introduction

The importance of detecting and preventing earnings management has become more critical than ever since the plague of huge account scandals took place in the period from 2000-2002, which have detrimental effects on different stakeholders of the firms. The 21 largest accounting scandals and the fall of the largest audit firm, Arthur Andersen[1] from 2000 to 2002 triggered the enactment of Sarbanes-Oxley Act of 2002, which represents an effort by the government to improve the transparency and creditability of financial reporting by firms. In spite of the passage of Sarbanes-Oxley Act (SOX) in July 2002 that holds firm management to be personally liable for the accuracy of all reported financial information of the firms, earnings manipulation activities have still been rampant. For example, in 2008, Lehman Brothers went bankrupt after it hid over $50 billion in loans which were disguised as sales. Lehman Brothers allegedly sold toxic assets to Cayman Island banks with the understanding that they would be bought back eventually. This created the impression that Lehman had $50 billion more cash and $50 billion less in toxic assets. In an environment that has been plagued with accounting scandals over the past decade, earnings management has been a central research topic for academics and practitioners alike (Dechow *et al.* 2012).

Earnings management can be classified into two categories: accruals-based earnings management and real activities manipulation. Accruals-based earnings management purely involves various accounting maneuvers to improve the earnings baseline, which should be reverted in the future period and should not affect the firm cash flows. Real activities manipulation, on the other hand, involves changes made to the normal business operations and

[1] The first scandal occurred in 2000, Xerox, followed by Enron (October 2001), Arthur Andersen (November 2001), Kmart and Homestore.com (January 2002), Global Crossing Qwest (February 2002) , Xerox (March 2002), AOL Time, Bristol –Myers, Squibb, Duke Energy, Merck, Mirant, Nicor Energy, LLC (April 2002), WorldCom (May 2002), Adelphia (June 2002), CMS, Energy, Dynergy, El Paso, Halliburton, Peregrime, Systems, Reliant Energy,and Tyco (Cohen *et al.* 2005).

consequently should affect the firm cash flows. Real activities manipulation can reduce firm value because actions taken in the current period to increase earnings can have a negative effect on cash flows in future periods (Roychowdhury 2006). As such, real activities manipulation should deserve more attention from researchers.

In this paper, we examine real activities manipulation by firms prior to their debt issuing and how such manipulation activities affect the price of the bond issues, which adds to the existing evidence of increased accruals manipulation prior to debt issues documented by Liu *et al.* (2010). Since real activities manipulation involves activities that alter the normal course of business of a firm such as changing the timing/structure of operating, financing and investing activities, it has substantial impacts on the future cash flows of the firm and thus firm valuation.

While Liu *et al.* (2010) document that firms managing earnings upward with accruals technique are able to issue debts at a lower cost and that bondholders fail to see through the inflated earnings numbers in pricing new debts, the passage of Sarbanes Oxley Act in July 2003 (SOX) has imposed closer scrutiny on accruals manipulation, which in turn leads to more real activities manipulation (Cohen *et al.* 2008) to divert the scrutiny; real activities manipulation can easily be disguised as normal business decisions and thus is more difficult to be detected. More importantly, Zang (2012) shows that managers tradeoff between discretionary accruals and real activities manipulation. Managers make their decisions on which earnings management methods to use based upon the evaluations of their respective costs and benefits. They typically engage in real activities manipulation during the fiscal year since it involves decisions on operating, financing and investing activities, and then adjust the accruals at the end of the fiscal year based upon the outcome of the real activities manipulation

during the year. Given that accruals might be a secondary earnings manipulation tool to real activities manipulation, it is interesting to examine whether managers actively use real activities manipulation prior to their debt issues.

We document that bond-issuing firms increase their levels of real activities manipulation in the five quarters leading to the bond issues. More interestingly, we find a negative relationship between yield spread and pre-issue real activities manipulation. Specifically, firms that engage in more real activities manipulation can issue debts at lower costs. Thus, bondholders fail to see through the real activities manipulation in pricing new debts. Since real activities manipulation affects firm future cash flows and subsequently its solvency capability, it is critical that bondholders have the incentives and the capability to look into real activities manipulation and charge the corresponding yield. We also find that bond-issuing firms engaged in more real activities manipulation before the passage of SOX, have high earnings volatility, issue more noninvestment bond, are large firms, and have high profitability (ROA). Furthermore, firms of larger issue size, shorter maturity, investment bond, higher earnings volatility, and lower profitability that engage in real activities manipulation are more likely to obtain lower yield spread.

The rest of the paper is organized as a follows. Section 2 presents the related literature and hypothesis development. Section 3 describes the data. Section 4 elaborates the research methodology. Section 5 discusses the results. Section 6 concludes and summarizes the principal results.

2. Literature Review and Hypotheses Development

A significant body of literature has identified that firms have the incentives to manage earnings in order to affect their share prices around certain important corporate events such as

initial public offering (IPO), seasoned equity offering (SEO), mergers and acquisitions, and bond issuance.

2.1. Initial Public Offering (IPO)

Researchers have found that firms manage earnings upwards before and during initial public offering years. Teoh *et al.* (1998a) suggest that IPO firms can report earnings in excess of their cash flows by undertaking positive accruals. They find that issuers with unusually high accruals in the IPO year experience poor stock return performance in the subsequent three years. Such evidence suggests that investors are misled by firms' earnings management around IPOs. Chaney and Lewis (1998) find that IPO firms tend to use discretionary accruals to smooth income relative to the prior year's earnings. Morsfield and Tan (2006) find evidence consistent with Teoh *et al.* (1998a) and show that venture-capitalist-backed IPOs are associated with lower earnings management.

On the other hand, Ball and Shivakumar (2008) present different results than those documented in previous literature in that IPO firms report more conservatively. They attribute this to the higher reporting quality demanded of public firms by financial statement users and consequentially higher monitoring by auditors, boards, analysts, rating agencies, press, and litigants. In the same line, Chang *et al.* (2010) focus on the underwriter reputation by arguing that prestigious underwriters have the incentives to protect their reputation by carefully monitoring and certifying financial information on IPO firms, thereby limiting any potential earnings manipulation. As a result, IPO firms that are associated with more prestigious underwriters are likely to exhibit much less aggressive earnings management. Hei Wai *et al.* (2012) support the findings by Chang *et al.* (2010) and find that the role of prestigious

underwriters in restraining earnings management of IPO issuers does not change during the Internet bubble period or after the passage of the Sarbanes-Oxley Act (SOX).

2.2. Seasoned equity offering (SEO)

Similar to the evidence in IPO, the literature has shown that firms manage earnings before their seasoned equity offerings (SEOs) as well (Rangan 1998; Teoh *et al.* 1998b; Cohen & Zarowin 2010). Rangan (1998) investigates whether earnings management around the time of the offering contributes to the subsequent poor performance. He finds that earnings management during the year of the offering predicts both earnings changes and market-adjusted stock returns in the following year. His findings suggest that the stock market temporarily overvalues issuing firms and is subsequently disappointed by the poor realized earnings.

Teoh *et al.* (1998b) find that issuers who adjust current discretionary accruals to report higher net income prior to the offerings have lower post-issue long-run abnormal stock returns and net income. They also document that the relation between current discretionary accruals and future returns (adjusted for firm size and book-to-market ratio) is stronger and more persistent for seasoned equity issuers than for non-issuers. Consistent with Rangan (1998) and Teoh *et al.* (1998b), Shivakumar (2000) finds evidence of earnings management around the SEOs. However, he shows that investors are able to predict earnings management by the issuing firms and rationally undo its effects at SEO announcements. He suggests that the results documented by Rangan (1998) and Teoh *et al.* (1998b) appear to be driven by test misspecification. He concludes that SEO's earnings management may not be designed to mislead investors, but reflect the issuers' rational responses to the anticipated market behavior at offering announcements.

More recently, Cohen and Zarowin (2010) find that SEO firms engage in more real activities manipulation prior to the issuing, and the decline in post-SEO performance due to the real activities management is more severe than that due to discretionary accrual management. More specifically, they show that post-SEO operating underperformance is driven not just by accrual reversals, but also reflects the real consequences of operational decisions made to manage earnings.

2.3.Mergers and acquisitions

Mergers and acquisitions are instances in which the firm's stock is employed as a payment currency in the transactions. Thus, the price of the acquiring company's stock is important (Ronen & Yaari 2008). If the acquiring firms use their own stocks to pay for acquisitions, they are likely to have the incentive to manage earnings upwards in order to make their payment currencies more valuable. Erickson and Wang (1999) and Louis (2004) investigate whether acquiring firms attempt to boost their stock price prior to stock-for-stock mergers in order to reduce the cost of buying the target. They suggest that the extant evidence of post-merger underperformance by acquiring firms can be partly attributed to the reversal of the price effects of earnings management. Botsari and Meeks (2008) evaluate earnings management by UK bidders and document similar results as in the study by Louis (2004).

2.4. Earnings management before bond issue

Before firms issue new debts, they deal with two opposing pressures. On the one hand, firms have incentives to inflate earnings to enhance the appearance of their reported solvency capacity so as to lower their borrowing costs. On the other hand, firms also have incentives to deflate earnings since a loan is a long-term commitment; therefore, firms have the pressure to report conservatively in order to build reserves (Ronen & Yaari 2008).

Roychowdhury (2006) finds evidence consistent with managers manipulating real activities to avoid reporting annual losses. Specifically, he finds evidence suggesting price discounts to temporarily increase sales, overproduction to report lower cost of goods sold, and reduction of discretionary expenditures to improve reported margins. Managers can increase earnings by reducing the cost of goods by overproducing inventory and/or cutting discretionary expenditures including research and development (R&D), advertising; and selling, general, and administrative expenditures (SG&A). Consequently, real activities manipulation is reflected in abnormal levels of production costs and discretionary expenses.

Liu et al. (2010) document that firm manage earnings upward by manipulating discretionary accruals prior to the bond issues. They also find that those firms are able to issue debt at a lower cost and bondholders fail to see through the inflated earnings numbers in pricing new debts. However, the passage of Sarbanes Oxley Act has imposed closer scrutiny on accruals manipulation, which in turn leads to more real activities manipulation (Cohen et al. 2008). However, Zang (2012) shows that managers tradeoff between discretionary accruals and real activities manipulation. Managers make the decisions on which earnings management methods to use based upon the evaluations of their respective costs and benefits. They typically engage in real activities manipulation during the fiscal year since it involves decisions on operating, financing and investing activities, and then adjust the accruals at the end of the fiscal year based upon the outcome of the real activities manipulation.

Although Zang (2012) does not assess debt issue, her findings together with those by Cohen and Zarowin (2010) imply that accrual based earnings management might be a secondary earnings manipulation tool to real activities manipulation. Given the results documents by Zang (2012), the results documented by Liu et al. (2010) that bondholders fail to

detect earnings manipulation (via accruals manipulation) might just be an artifact of the fact that accruals manipulation tends to be reverted in the upcoming period and has no impact of firm cash flows. Bondholders might very well see through accruals manipulation by managers but do not penalize managers, since they realize accruals manipulation has no significant impact on firm cash flows. They may have greater incentives and the capability to look into real activities manipulation, which is more critical to the future cash flows of the firms. However, the counter argument is that bondholders might not be able to detect real activities manipulation given its complicated nature, which in turn is detrimental to bondholders' wealth given that real activities manipulation has real cash flow consequences.

Therefore, we hypothesize that managers actively use real activities manipulation prior to their debt issues.

H1: Firms engage in real activities manipulation prior to bond issuance.

2.5. Real activities manipulation and bond yield spreads

If firms engage in real activities manipulation prior to debt issuance, the next question is whether real activities manipulation leads to reduced cost of debt. The results by Liu et al. (2010) suggest that bondholders fail to detect earnings manipulation (via accruals manipulation) might just be an artifact of the fact that accruals manipulation tends to be reverted in the upcoming period and has no impact of firm cash flows. Bondholders might very well see through accruals manipulation by managers, but do not penalize managers since they realize accruals manipulation has no significant impact on firm cash flows.

Ahmed *et al.* (2002) find that accounting conservatism (measured as market-based and an accrual-based) is associated with a lower cost of debt. This evidence is consistent with the notion that accounting conservatism plays an important role in mitigating bondholder-

shareholder conflicts over dividend policy and in reducing firms' debt costs. Francis *et al.* (2005) find that firms with lower quality earnings have lower debt rating and larger realized costs. They also find that firms with the best earnings quality get a discount in their cost of debt relative to firms with the worst earnings quality, which in turn suggests that bondholder see through the managed earnings numbers in pricing new debts.

Since real activities manipulation can be masked as normal operation decisions to improve the reported earnings and thus the solvency prospect of the firm, we argue that it is more difficult for investors in the company bond to detect such earnings management.

H2: Firms use real activities manipulation to lower the cost of debt.

3. Data

We obtain the bond issue data by U.S. firms from 1980 to 2012 from SDC Platinum New Issue Database. We eliminate observations without information about total proceeds and spread to benchmark. We also eliminate firms that are not listed in both Compustat and CRSP. We identify the earnings management activities of these bond-issuing firms in the 8 quarters preceding and 8 quarters following the issues. The final sample size includes 5,608 firm-quarter observations equivalent to 1,578 firms.

Table 1 shows the distribution of the final sample by year, bond rating and firm industry. The number of bond issues has increased since 1990. Most of the bond issues do not have restrictive covenants (96.9%) and are investment grade bonds (60.3%). About 16.5% of the sample is from manufacturing industry, followed by wholesale, retail, and services (14.9%) and other industries (17%).

[Insert Table 1 about here]

We also report the sample descriptive statistics in Table 1.Bond issuers tend to be large firms, with the average sales of $3,157 million and assets of $13,993 million. However, the high standard deviations in total assets show considerable variations in firm sizes. On average, bond issuers finance their assets with 67% of debt. The sample firms are of low profitability (e.g. ROA is 0.76% on average) and have an average market to book ratio of 2.2. On the bond specific characteristics, the average proceed is $313.05 million, with a yield spread of 257.19 basis points similar to Liu *et al.* (2010) and Klock *et al.* (2005), who report mean yield spreads of 224 and 245 basis points, respectively, for their samples. We use yield spread (YS) as the proxy for the cost of debt of the firm. Yield spread is the difference between the yield of the issued bond and a comparable maturity U.S. Treasury bond measured in basis point. If a firm has multiple bond issues in a given quarter, YS is the weighted average yield spreads of all the issues in the same quarter. On average, the maturity of the bonds is 46.45 quarters (11.6 years) and the credit rating of 13.5 equivalents to an S&P rating between BBB- and BBB; thus, most of the bond issues are investment grade bonds.

4. Methodology

4.1. Earnings Management Constructions

4.1.1. Accrual-based earnings management

Following previous research (Sloan 1996; Ronen & Yaari 2008; Dechow et al. 2010; Walker 2013), we use discretionary accruals to proxy for accrual-based earnings management. Discretionary accruals are measured as the difference between firms' actual accruals and the normal level of accruals. We use the following modified Jones (1991) model to obtain the normal level of accruals:

$$\frac{Accruals_{i,t}}{A_{i,t-1}} = \alpha_0 + \alpha_1\left(\frac{1}{A_{i,t-1}}\right) + \alpha_2\left(\frac{\Delta SALES_{i,t}}{A_{i,t-1}}\right) + \alpha_3\left(\frac{PPE_{i,t}}{A_{i,t-1}}\right) + \varepsilon_{i,t} \quad (1)$$

where $Accruals_{i,t}$ is the earnings before extraordinary items and discontinued operations minus the operating cash flows from the statement of cash flows (net cash flow minus total receivables) of firm i in quarter *t*. $A_{i,t-1}$ is total asset of firm we in quarter *t-1*, $\Delta SALES_{i,t}$ is the change in sales from the preceding quarter of firm *i*, and $PPE_{i,t}$ is the total gross value of property, plant and equipment of firm i in quarter *t*. $\varepsilon_{i,t}$ is the estimated residual that represents the discretionary accruals which are used as a proxy for accrual-based earnings management (AM) of firm i in quarter *t*.

We estimate Equation 1 cross-sectionally for each industry-quarter with at least 15 observations, where industry is defined following the Fama and French 48-sector industry classification. The residuals from the above regressions are the discretionary accruals. We estimate the equation with robust standard errors. This method estimates the asymptotic covariance matrix of the estimates under the hypothesis of heteroscedasticity. The standard error estimates from the asymptotic covariance matrix can be more robust and can deal with a collection of minor concerns about failure to meet OLS assumptions.

4.1.2. Real activities manipulation

Following Roychowdhury (2006) and Zang (2012), we use abnormal discretionary expenses and abnormal production cost to proxy real activities manipulation. Managers can increase earnings by overproducing inventory to report lower costs of goods sold. With overproduction, managers can spread fixed overhead costs over a larger number of units, thus decreasing the reported cost of goods sold and increasing reported operating margins (Roychowdhury 2006; Cohen *et al.* 2008; Cohen & Zarowin 2010). At the same time managers

can cut discretionary expenditures to increase the reported earnings, examples of this practice include research and development (R&D), advertising, and selling, general, and administrative expenditures (SG&A). Consequently, real activities manipulation is reflected in abnormal levels of production costs and discretionary expenses.

Similar to abnormal discretionary accruals, abnormal production costs and abnormal discretionary expenses are estimated as the difference between the actual values and the normal/expected values of these variables. We estimate the normal level of production costs using the following model:

$$\frac{PROD_{i,t}}{A_{i,t-1}} = \beta_0 + \beta_1\left(\frac{1}{A_{i,t-1}}\right) + \beta_2\left(\frac{Sales_{i,t}}{A_{i,t-1}}\right) + \beta_3\left(\frac{\Delta Sales_{i,t}}{A_{i,t-1}}\right) + \beta_4\left(\frac{\Delta Sales_{i,t-1}}{A_{i,t-1}}\right) + \mu_{i,t} \quad (2)$$

where $PROD_{i,t}$ is the sum of the cost of goods sold of firm i in quarter *t* and the change in inventory from quarter *t-1* to *t;* A_{t-1} is the total assets of firm i in quarter *t-1;* $Sales_{i,t}$ is the net sales of firm i in quarter *t;* and $\Delta Sales_{i,t}$ is the change in net sales of firm we from quarter *t-1* to *t.*

Equation 2 is estimated cross-sectionally for each industry-quarter with at least 15 observations with robust standard errors, where industry is defined following the Fama and French 48-sector industry classification, to capture the impact of industry-wide economic conditions during the quarter on the firm production costs. The abnormal level of production cost (RM_PROD) is measured as the residuals from equation (2) ($\mu_{i,t}$). The higher the residuals, the larger is the amount of abnormal production costs, and the greater is the increase in reported earnings through reducing the cost of goods sold (e.g. stronger indication of real activities manipulation).

We estimate the normal level of discretionary expenditure using the following model:

$$\frac{DISX_{i,t}}{A_{i,t-1}} = \gamma_0 + \gamma_1\left(\frac{1}{A_{i,t-1}}\right) + \gamma_2\left(\frac{Sales_{i,t-1}}{A_{i,t-1}}\right) + e_{i,t} \quad (3)$$

where $DISX_t$ is the discretionary expenditures (i.e., the sum of R&D, advertising, and SG&A expenditures) of firm i in quarter *t;* A_{t-1} is the total assets of firm i in quarter *t-1;* $Sales_{i,t}$ is the net sales of firm i in quarter *t.* As Equations 1 and 2, the equation for the normal level of discretionary expenditure (Equation 3) is estimated cross-sectionally for each industry-quarter combination with at least 15 observations using robust standard errors. The abnormal level of discretionary expenditures is measured as the estimated residuals from the regression ($e_{i,t}$).

We multiply the residuals by -1 (denoted as RM_DISX) such that the higher the residuals, the larger the amount of discretionary expenditures cut by firms to increase reported earnings. The abnormal production costs and abnormal discretionary expenses are aggregated into one single proxy for real activities manipulation (RM). The higher the value of this aggregate measure, the more likely the firm is engaged in real activities manipulation (Zang 2012).

4.1.3. Unexpected real activities manipulation

Studies prior to Zang (2012) treat *RM* and *AM* as two separate methods to manipulate earnings. Zang (2012) argues and documents that managers trade off the two earnings management methods based on their relative costs. More specifically, managers adjust the level of accrual-based earnings management at the end of the fiscal year, depending on whether the real activities manipulation during the fiscal year can achieve the targeted earnings number. Following Zang (2012), we estimate the unexpected component of real activities manipulation while controlling for the costs/benefits trade-offs between *RM* and *AM* using the following model:

$$RM_{i,t} = \delta_0 + \delta_1 Market\_Share_{i,t-1} + \delta_2 Zscore_{i,t-1} + \delta_3 Inst_{i,t-1} + \delta_4 \mathrm{NOA}_{i,t-1} +$$

$$\delta_5 \mathrm{Cycle}_{i,t-1} + \delta_6 \mathrm{LMC}_{i,t} + \delta_7 \mathrm{RNDR}_{i,t} + \delta_8 \mathrm{DEBTR}_{i,t} + \delta_9 \mathrm{MB}_{i,t} + \delta_{10} \mathrm{ROA}_{i,t} + u_{i,t} \quad (4)$$

where $RM_{i,t}$ is total real earnings management of firm i in quarter t measured as the sum of $RM_PROD_{i,t}$and $RM\_DISX_{i,t}$; $RM\_PROD_{i,t}$ is the abnormal level of production cost of firm i in quarter *t* from equation (2); and $RM\_DISX_{i,t}$ is the abnormal level of discretionary expenditures of firm i in quarter *t.* We use as a proxy for the costs of RM firms' market share, Z-score, and institutional ownership and for the costs of AM by a dummy variable for firms with relatively high net operating assets to sales at the start of the quarter and a measure of the length of the firm's operating cycle. In addition, we also employ other control variables, including firm size (LMC), research and development expense ratio (RNDR), market-to-book ratio (MB) and firm return on asset (ROA). We elaborate the construct of these control variables and their expected relationship with earnings management measures in Appendix 1.

We estimate Equations 1 through 4 using the whole population of 897,269 non-financial and non-utitilities firm-quarter observations covered in Compustat Quarterly Database from 1980-2012. We report the estimation results for the normal levels of total accruals (Equation 1), production costs (Equation 2), and discretionary expenditures (Equation 3) in Panel A of Table 3. The regressions are estimated cross-sectionally for each industry-quarter combination with at least 15 observations. We winsorize the coefficients at the top and bottom 1% levels to avoid extreme observations. On average, each industry-quarter regression has more than 120 observations. All the mean coefficients are significant at 1% level and qualitatively similar to those reported in Roychowdhury (2006) and Zang (2012). The mean adjusted R^2 is 68% for the production cost model, 32% for the discretionary expenditure

model, and 21% for the accrual model, showing that these models have as much explanatory power as those reported by Roychowdhury (2006) and Zang (2012).

We present the results from the regressions to derive the earnings management measures from Equations 1 to 3 in Panel A of Table 2. The result from the estimation of the unexpected real activities manipulation (Equation 4) are reported in Panel B in Table 4. The results are consistent with those reported by Zang (2012). The summary statistics for the proxies of abnormal levels of production costs, discretionary expenditures, and discretionary accruals calculated as the estimate residuals[2] ($RM\_PROD_{i,t}, RM\_DISX_{i,t}, and\ AM_{i,t}$, respectively) are reported in Panel C of Table 2. Consistent with the results reported by Zang (2012), the mean values of *AM* and *RM_PROD* are negative, the mean *RM* is zero, and *RM_DISX* mean is positive.

[Insert Table 2 about Here]

4.2. Univariate analyses

We evaluate the level of real activities manipulation in the 8 quarters leading to and the 8 quarters following the bond issues. We use 4 measures to proxy real activities manipulation ($RM, RM\_PROD, RM\_DISX, and\ U\_RM$) and one measure of accrual-based earnings management. The traditional t-test and non-parametric Wilcoxon test are employed to test for the significant changes in real earnings management activities. [3]

[2] To standardize, normalize and avoid outliers in the residuals.

[3] For the sake of brevity, we only report this univariate analysis for the whole sample. However, We also examine the differences in real activities manipulation for different sub-samples. In the first subsample, we compare the bond issuers in the pre-SOX period to those in the post-SOX period. Since SOX sets new standards for all U.S public companies and public accounting firms in which top management must individual certify the accuracy of the reported financial information, we expect that accrual-based earnings management should be alleviated and real activities manipulation should increase for the post-SOX subsample (Cohen *et al.* 2008). We also compare and contrast the subsamples of low versus high (i) standard deviations of earnings before extraordinary items for the past eight quarters prior to bond issues, (ii) firm's size (market capitalization), (iii) bond rating, and (iv) profitability as measured by ROA.

4.3. Multivariate analyses

We run multivariate regressions in which we control for firm characteristics that might affect the use of real activities manipulation and accrual-based earnings management. Given that a firm might have issued bonds multiple times over the sample period, we correct the standard errors for firm-clustering effect following Rogers (1993). The firm-clustering corrected standard errors allow for intra-group correlation by relaxing the usual requirement that the observations be independent. Thus, the observations are independent across firms but not necessarily within firms.

$$RM_{i,j} or\ RM\_PROD_{i,j} or\ RM\_DISX_{i,j} = \delta_0 + \sum_{j=-8}^{4} \delta_{1,j} DQ_{i,j} + \delta_2 Market\_Share_{i,j-1} + \delta_3 Zscore_{i,j-1} + \delta_4 Inst_{i,j-1} + \delta_5 \mathrm{NOA}_{i,j-1} + \delta_6 \mathrm{Cycle}_{i,j-1} + \delta_7 \mathrm{LMC}_{i,j} + \delta_8 \mathrm{RNDR}_{i,j} + \delta_9 \mathrm{DEBTR}_{i,j} + \delta_{10} \mathrm{MB}_{i,j} + \delta_{11} \mathrm{ROA}_{i,j} + \varepsilon_{i,j} \quad (5)$$

$$U\_RM_{i,j} = \theta_0 + \sum_{j=-8}^{4} \theta_{1,j} DQ_{i,j} + \theta_2 \mathrm{LMC}_{i,j} + \theta_3 \mathrm{MB}_{i,j} + \theta_4 \mathrm{ROA}_{i,j} + \epsilon_{i,j} \quad (6)$$

$$AM_{i,j} = \vartheta_0 + \sum_{j=-8}^{4} \vartheta_{1,j} DQ_{i,j} + \vartheta_2 U\_RM_{i,j} + \vartheta_3 Market\_Share_{i,j-1} + \vartheta_3 Zscore_{i,j-1} + \vartheta_4 Inst_{i,j-1} + \vartheta_5 \mathrm{NOA}_{i,j-1} + \vartheta_6 \mathrm{Cycle}_{i,j-1} + \vartheta_7 \mathrm{LMC}_{i,j} + \vartheta_8 \mathrm{RNDR}_{i,j} + \vartheta_9 \mathrm{DEBTR}_{i,j} + \vartheta_{10} \mathrm{MB}_{i,j} + \vartheta_{11} \mathrm{ROA}_{i,j} + \omega_{i,j} \quad (7)$$

where $RM_{i,j}\ and\ U\_RM_{i,j}$ are the abnormal and unexpected level of total real earnings management for firm we in quarter *j* respectively and $AM_{i,j}$ is the discretionary accrual. DQ_i is a series of dummies variable that takes the value of 1 for each quarter before bond issue (-8, -1) and 0 otherwise. We also run the model using a dummies for two intervals of time before firms issue debt, quarters (-8, -5) and (-4,-1). We expect the coefficients on the dummies for the quarters to be larger as they are closer to the bond issues.

To assess if real activities manipulation prior to bond issue could be detected and priced into the bond issues by bondholders while controlling for firm characteristics that might affect the yield spread, we estimate the following model as suggested by Liu *et al.* (2010):

$$YS_{i,j} = \gamma_0 + \gamma_1 EM_{i,j-1} + \gamma_2 LTA_{i,j} + \gamma_3 ROA_{i,j} + \gamma_4 DEBT_{i,j} + \gamma_5 MB_{i,j} + \gamma_6 RV_{i,j-1} + \gamma_7 Coll_{i,j} + \gamma_8 LP_{i,j} + \gamma_9 LM_{i,j} + \gamma_{10} Rating_{i,j} + \xi_{i,j} \quad (8)$$

where:

$YS_{i,t}$ is the proceeds-weighted bond yield spread for each firm i in quarter *j*;

$EM_{i,j-1}$ is one of the measures of real activities manipulations for firm i in quarter *j-1*;

$LTA_{i,j}$ is the natural logarithm of total asset for firm i in quarter *j*, since larger firms tend to be less risky and can enjoy lower costs of debt;

$ROA_{i,j}$ is the return on asset computed as the ratio of net income to total assets for firm i in quarter *j*;

$DEBT_{i,j}$ is the of total debt to total assets for firm i in quarter *j*;

$MB_{i,j}$ is the market value of asset divided by book value of assets for firm i in quarter *j*;

$Coll_{i,j}$ is firm collateral measured as the ratio of property, plan, and equipment to total assets. Firms with greater collateral present lower risk to investors and are expected to have a lower cost of debt for firm i in quarter *j*;

$RV_{i,j}$ is the variance of daily stock returns in the quarter preceding the bond issuance, since equity volatility is related to the cost of debt for firm i in quarter *j*;

$LP_{i,j}$ is the natural logarithm of total proceeds of the bond issue for firm i in quarter *j*;

$LM_{i,j}$ is the natural logarithm of the number of quarter to bond maturity for firm i in quarter *j*. If a firm has more than one bond issue in a quarter $LP_{i,j}$ and $LM_{i,j}$ are proceeds-weighted.

$Rating_{i,j}$ is the proceeds-weighted numerical credit ratings orthogonalized to other control variables in the regression for firm *i* in quarter *j*.

To proxy for ratings, we use Standard and Poor's credit ratings which reflect the company's overall creditworthiness. Following Klock *et al.* (2005), we assign AAA bond ratings a value of 22 and D rating a value of 1. If the Standard and Poor rating are missing but Moody's rating is available, we use Moody's rating. The conversion of credit ratings to numeric values is present in Appendix 2.

[Insert Appendix 2 about here]

5. Empirical Results

5.1. Univariate Results – Real Activities Manipulation around Bond Issue

Table 3 reports the mean real activities manipulation and the discretionary accruals around the bond offerings, from quarters -8 to +6 relative to the issuance quarter (quarter 0). Firms increasingly engage in real earnings management from quarter -5. This increasing trend before the bond issue is demonstrated in Figures 1 and 2. Most interestingly, the difference between the mean values of real earnings manipulation activities in quarters -8 to -5 and those in quarters -4 to -1 is positive and significant, suggesting that managers actively engage in more earnings management activities right before the imminent bond offerings. Similar results are shown for the unexpected total real earnings management. While Liu *et al.* (2010) only report significant increases in discretionary accruals one year before bond issuance, we show that firms increase discretionary accruals before bond issue, specifically, starting from the 3 quarters before the bond issue. Thus, the univariate results suggest that bond issuers engage in both real activities manipulation and accrual-based earnings management prior to bond issuance.

[Insert Table 3 about here]

[Insert Figures 1 and 2 about here]

5.2. Cross-sectional results – real activities manipulation around bond issue

The univariate results suggest that there is an increase in real activities manipulation prior to bond issues, supporting Hypothesis 1. To confirm this result in a multivariate setting, we estimate Equations 5 to 7 by stacking the observations in the 12 quarters around of the bond issue. Table 4 shows the regression results. When RM (in Panel A) and U_RM (in Panel B) are the dependent variables, we can see an increase in the coefficients of the quarter dummies variables leading to the issuance quarters (DQ_{-5}, DQ_{-4}, and DQ_{-2}). The coefficient of $DQ_{(-4,-1)}$ is also significant and larger in magnitude than the quarter dummy $DQ_{(-8,-5)}$. Thus, the results in Table 4 confirm that bond issuers increase real activities manipulation prior to their bond issue, supporting Hypothesis 1.

[Insert Table 4 about here]

5.3. Yield spreads and real activities manipulation around bond issue

The results above suggest that firms progressively engage in real activities manipulations prior to their bond issue. Thus, the next question is whether real activities manipulation leads to reduced cost of debt. To test Hypothesis 2, we estimate Equation 8 above.

Credit rating is used as a control variable which may have already incorporated the information of other control variables and may result in a multicollinearity problem. To address that issue, we orthogonalize the credit rating measure against firm characteristics that might be highly correlated with it and use this orthogonalized measure of credit rating instead

of the raw credit rating measure following the suggestions by Ashbaugh-Skaife *et al.* (2006) and Liu et al (2010). Specifically, we estimate the following model and obtain the residuals:

$$Rating_{i,j} = \alpha_0 + \alpha_1 LTA_{i,j} + \alpha_2 ROA_{i,j} + \alpha_3 DEBT_{i,j} + \alpha_4 MB_{i,j} + \alpha_5 RV_{i,j-1} + \alpha_6 Coll_{i,j} + \alpha_7 LP_{i,j} + \alpha_8 LM_{i,j} + \mu_{i,j} \quad (9)$$

where $Rating_{i,t}$ is the is the proceeds-weighted numerical credit ratings for each firm i in quarter *j*;

$LTA_{i,j}$ is the natural logarithm of total asset for firm i in quarter *j*, since larger firms tend to be less risky and can enjoy lower costs of debt;

$ROA_{i,j}$ is the return on asset computed as the ratio of net income to total assets for firm i in quarter *j*;

$DEBT_{i,j}$ is the of total debt to total assets for firm i in quarter *j*;

$MB_{i,j}$ is the market value of asset divided by book value of assets for firm i in quarter *j*;

$Coll_{i,j}$ is firm collateral measured as the ratio of property, plan, and equipment to total assets, firms with greater collateral present lower risk to investors and are expected to have a lower cost of debt for firm i in quarter *j*;

$RV_{i,j}$ is the variance of daily stock returns in the quarter preceding the bond issuance, since equity volatility is related to the cost of debt for firm i in quarter *j*;

$LP_{i,j}$ is the natural logarithm of total proceeds of the bond issue for firm i in quarter *j*;

$LM_{i,j}$ is the natural logarithm of the number of quarter to bond maturity for firm i in quarter *j*. If a firm has more than one bond issue in a quarter $LP_{i,j}$ and $LM_{i,j}$ are proceeds-weighted. The residuals from Equation 8 contain credit rating information net of the impact of these control variables. We use the residuals as the credit rating variable in subsequent analyses. Table 5 presents the regression results from Equation 9.

[Insert Table 5 about here]

Table 6 shows the estimation results of Equation 8 (yield spread regressions) with the standard errors corrected for firm-clustering effects. The estimated coefficient on RM_{t-1} variable is negative and significant at 5% level in model 1. This result holds if we use the mean of total real activities manipulation in quarters -4 to -1 instead; the coefficient on $RM_{mean(-4,-1)}$ is negative and significant (see model 2). Thus, the results suggest a negative relationship of real activities manipulation and yield spread. In other words, pre-issue earnings manipulation through real activities by issuing firms lowers the cost of debt financing. This evidence is consistent with our hypothesis that real activities manipulation inflates issuing firm's cash flows, and bondholders are not able to realize that the reported earnings are higher than what can be explained by actual cash flows. Upon being lured by the inflated earnings of the bond issuers, the bondholders impose lower required rates of returns on bonds issued by firms with more aggressive real activities manipulations. The coefficients on URM and AM variables are negative and insignificant.

[Insert Table 6 about here]

5.4. Robustness Check 1 - Endogeneity issue

The relationship between bond yield spread and real activities manipulation may not be unidirectional; these two elements could be jointly determined. Therefore, if there is any endogeneity concern in decision making with regard to the pricing of debt and real activities manipulation, the results could be biased. To address the potential endogeneity concern, we estimate a system of structural equations using three-stage least square (3SLS) model. In the first equation, *Yield Spread* (YS) is the dependent variable and in the second equation RM is

the dependent variable. In both equations, the first lagged values of YS and RM are endogenous explanatory variables. Specifically, we estimate the following model:

$$YS_{i,j} = \beta_0 + \beta_1 EM_{i,j-1} + \beta_2 LTA_{i,j} + \beta_3 ROA_{i,j} + \beta_4 DEBT_{i,j} + \beta_5 MB_{i,j} + \beta_6 RV_{i,j-1} + \beta_7 Coll_{i,j} + \beta_8 LP_{i,j} + \beta_9 LM_{i,j} + \beta_{10} Rating_{i,j} + \xi_{i,j} \quad (10)$$

$$RM_{i,t} = \vartheta_0 + \vartheta_1 MI_{i,t-1} + \vartheta_2 AM_{i,t} + +\vartheta_3 Zscore_{i,t} + \vartheta_4 BIG8_{i,t} + \vartheta_5 ARM_{i,t} + +\vartheta_6 SOX_{i,t} + \vartheta_7 Cycle_{i,t} + \vartheta_8 NOA_{i,t} + \varphi_{i,t} \quad (11)$$

Following Kim and Park (2005) and Liu *et al.* (2010), in equation (4.17), we use the absolute value of total real activities manipulation as exogenous instrument for real activities manipulations and an indicator variable that equals to one if the firm's auditor is one of the eight largest accounting firms and zero otherwise ($Big8$). Previous research shows that firms audited by the 8 largest auditing firms inhibit their earnings management through discretionary accruals, because these big auditing firms are more experienced in detecting earnings management, and have the incentive to protect their reputation. Following Zang (2012), we use additional instrument variables, which are proxies for the costs of real activities manipulation, including Z-score and a dummy variable for post-Sarbanes-Oxley (*SOX*), and proxies of the costs of AM including a dummy variable for firms with relatively high net operating assets to sales at the start of the quarter (NOA) and a measure of the length of the firm's operating cycle ($Cycle$).

The results in Table 7 show that RM_{t-1} negatively affects YS while YS has no effect on RM, which confirms the results in the preceding tables. Issuing firms actively engage in real activities manipulation to improve their reported earnings and enhance their bargaining power. The end result is lower cost of issuing debts.

[Insert Table 7 about here]

5.5. Robustness Check 2 - Yield spread and real activities manipulation by some bond issue and issuer characteristics.

We examine whether the inverse relationship between corporate bond yield spread and real activities manipulation varies with some specific bond issue and issuer characteristic. First, we divide the sample by the issue size relative to the total assets. Liu *et al.* (2010) document that accrual-based earnings management is greater in larger issues. Thus, if managers inflate reported earnings through real activities manipulation to reduce the cost of debt, then the savings in the cost of debt due to real activities manipulation can be greater in larger issues than in smaller ones. However, different from the evidence documented by Liu et al. (2010) for accrual-based earning management, the results in models 1 and 2 of Table 8 show that the coefficients on $RM_{mean(-4,-1)}$ are negative and significant at 5% level for smaller issues while insignificant for larger issues. Thus, real activities manipulation is more likely to result in lower yield spreads when the size of a bond issue is relatively small.

[Insert Table 8 about here]

Second, we divide the sample by issue maturity. Models 3 and 4 of Table 8 shows that the coefficients on $RM_{mean(-4,-1)}$ are negative and significant at 5% level for both shorter maturity issues and longer maturity issues. We also divide the sample by bond rating. Models 5 and 6 of Table 8 show that firms that issue investment bond engage in more real activities manipulations than noninvestment bonds. A firm issues an investment bond when the rating of the issue is greater than 12 (or Ba1for Moody's and BB+ for S&P); thus, those firms are less risky according to their rating classification. As a result, manager of investment bond increase real activities manipulation prior bond issue because they are subject to less public scrutiny.

On the issuing firm characteristics, we divide the sample into 2 subsamples based upon the issuing firm market capitalization. Models 7 and 8 of Table 8 show that the negative relationship between yields spread and real activities manipulation exists only for large issuers. We also divide the sample by the issuer's earnings volatility measured as the standard deviation of the income before extraordinary items in the eight quarters preceding the bond issue. We expect that issuers with higher earnings volatility engage in more real activities manipulation. Models 9 and 10 of Table 8 show that the coefficients on $RM_{mean(-4,-1)}$ are negative and significant at 10% level for higher earnings volatility issuers. On the other hand, the coefficients are negative but not significant for firms with lower earnings volatility. Thus, real activities manipulation is more likely to result in lower yield spread when the earnings volatility of the issuer is higher.

6. Summary and Conclusions

The objective for this chapter is to examine real activities manipulation by firms prior to their debt issuing and how such manipulation activities affect the pricing of the bond issues. The findings in this essay add to the existing evidence of increased accruals manipulation prior to debt issues. we show that real activities manipulation not only exists in equity offering firms (Cohen & Zarowin 2010) but also in bond offering firms as well.

Using abnormal and unexpected real activities manipulation to proxy for earnings management, we document that bond issuing firms increase real activities manipulation in the 5 quarters leading to the bond issues. We also find that bond- issuing firms that have more earnings volatility, issue non-investment grade bonds, are bigger in size, and have higher profitability engage more in real activities manipulation. More interestingly, we find a negative

relation between yield spread and pre-issue real activities manipulation. The inverse relationship is more severe when the issue is small and involves investment bonds, and when the issuer is large, has high earnings volatility or has low profitability. Thus, firms that engage in more real activities manipulation can issue debts at lower costs.

Thus, bondholders fail to see through the real activities manipulation in pricing new debts. Since real activities manipulation affects firm future cash flows and subsequently its solvency capability, it is critical that bondholders have the incentives and the capability to look into real activities manipulation and charge the corresponding yield.

Table 1 – Sample Distribution and Descriptive Statistics

Issue Year	*N*	*Percent*
1980	53	0.95
1981	32	0.57
1982	67	1.2
1983	44	0.79
1984	46	0.82
1985	93	1.67
1986	136	2.44
1987	95	1.7
1988	69	1.24
1989	69	1.24
1990	61	1.09
1991	126	2.26
1992	175	3.13
1993	221	3.96
1994	109	1.95
1995	168	3.01
1996	166	2.97
1997	239	4.28
1998	378	6.77
1999	257	4.6
2000	137	2.45
2001	294	5.27
2002	258	4.62
2003	283	5.07
2004	213	3.81
2005	173	3.1
2006	158	2.83
2007	178	3.19
2008	135	2.42
2009	281	5.03
2010	290	5.19
2011	239	4.28
2012	341	6.11
Total	5,584	100

Covenants	*N*	*Percent*
No	5,397	96.65
Yes	187	3.35
Bond Rating	***N***	***Percent***
Noninvestment	2,218	39.72
Investment	3,366	60.28
Industry	***N***	***Percent***
Business Equipment	443	7.93
Chemicals and Allied Products	402	7.2
Consumer Durables	167	2.99
Energy	628	11.25
Healthcare, Medical Equipment, and Drugs	300	5.37
Manufacturing	921	16.49
Consumer Nondurables	448	8.02
Wholesale, Retail, and Some Services	831	14.88
Telephone and Television Transmission	465	8.33
Others	979	17.53
Firm and Bond Issue Characteristics		
Variables	Mean	Median
Sales	3,156.78	932.67
Assets	13,993.06	4,144.60
ROA	0.76%	1.06%
Leverage	0.67	0.64
LtLev	0.34	0.31
M/B	2.20	2.17
RetVar	0.00	0.00
Collateral	0.40	0.36
Yield spread	257.19	181.00
Rating	13.47	14.00
Maturity	46.45	40.00
Proceeds	313.05	225.00

This table provides the distribution and the descriptive statistics of 5,608 firm-quarter observations over the period from 1980 to 2012 for the pooled sample. Sales is the net sales; Assets is the book value of total assets; ROA is ratio of income before extraordinary item to total assets; Leverage is the ratio of total debt to total assets; LtLev is the long-term debt over total assets; M/B is the market value of equity divided by the book value of equity; RetVar is the variance of stock returns over one quarter prior to bond issuance; Yield spread is the difference between the issue yield of the bond and a comparable maturity U.S. maturity Treasury bond measured in basis point; Rating is the bond's credit rating; Maturity is the number of quarter bonds are outstanding; Proceeds is the amount for the entire transaction, in millions of dollars.

Table 2 - Measurement of Real Activities Manipulation and Accrual-Based Earnings Management

Panel A - Estimation of the Normal Levels of Production Costs, Discretionary Expenditures and Accruals

$Model\ 1 - PROD_{i,t}/A_{i,t-1}$		$Model\ 2 - DISX_{i,t}/A_{i,t-1}$		$Model\ 3 - Accruals_{i,t}/A_{i,t-1}$	
Intercept	-0.018	Intercept	-0.191	Intercept	-1.446
	(-20.2***)		(-6.9***)		(-7.6***)
$1/A_{i,t-1}$	0.079	$1/A_{i,t-1}$	0.191	$1/A_{i,t-1}$	0.110
	(14.8***)		(39.3***)		(11.2***)
$Sales_{i,t}/A_{i,t-1}$	0.779	$Sales_{i,t-1}/A_{i,t-1}$	0.170	$\Delta Sales_{i,t}/A_{i,t-1}$	7.141
	(169.8***)		(22.8***)		(9.5***)
$\Delta Sales_{i,t}/A_{i,t-1}$	-0.049			$PPE_{i,t}/A_{i,t-1}$	0.382
	(-9.9***)				(9.2***)
$\Delta Sales_{i,t-1}/A_{i,t-1}$	-0.027				
	(-6.4***)				
Mean R^2	0.69		0.34		0.24
Mean Adj. R^2	0.68		0.32		0.21
Mean # of obs.	139.2		124.6		174.4

Panel B: Estimation of the Abnormal Levels of Production Costs, Discretionary Expenditures and Unexpected Total Real Earnings Management

Variables	$RM\_PROD_{i,t}$	RM_DISX	RM
Intercept	-0.064	0.118	0.052
	(-6.9***)	(12.4***)	(3.4***)
$Market\_Share_{t-1}$	-0.033	-1.048	1.006
	(-0.6)	(-21.1***)	(11.2***)
$Zscore_{t-1}$	-0.004	0.014	-0.018
	(-3.2***)	(11.6***)	(-9.1***)
$Inst_{t-1}$	0.010	0.028	-0.018
	(0.2)	(0.6)	(-0.3)
NOA_{t-1}	0.004	-0.009	0.013
	(3.3***)	(9.3***)	(7.3***)
Cycle_{t-1}	0.000	0.000	0.000
	(5.8***)	(10.9***)	(-2.8***)
LMC_t	0.009	-0.007	0.002
	(7.1***)	(-5.3***)	(1.1)
RNDR_t	-7.635	-3.068	-10.700
	(-1.8*)	(-0.8)	(-2.8***)
DEBTR_t	0.052	-0.061	-0.004
	(5.1***)	(-5.7***)	(-0.3)
MB_t	0.001	-0.003	-0.002
	(0.4)	(-1.8*)	(-0.8)
ROA_t	-2.049	0.311	-1.707
	(-23.4***)	(3.9***)	(-12.5***)
Mean R^2	0.209	0.280	0.226
Mean Adj. R^2	0.101	0.185	0.122

Panel C- Summary Statistics for Real Activities Manipulation and Accrual-Based Earnings Management

Variable	N	Mean	Median	Std. Dev.	25%	75%
AM	709,698	-0.003	0.040	0.968	-0.351	0.369
RM	878,823	0.000	0.051	1.473	-0.524	0.604
RM_PROD	878,823	-0.003	-0.044	0.916	-0.370	0.302
RM_DISX	878,823	0.003	0.114	0.905	-0.202	0.389
U_RM	835,916	-0.001	0.022	1.030	-0.402	0.429

U_RM_PROD	835,916	-0.002	-0.030	1.022	-0.424	0.377
U_RM_DISX	835,916	-0.001	-0.078	-1.040	-0.310	0.424

This table reports the regressions estimated to obtain the earnings management variables. The regressions in Panel A are estimated cross-sectionally for each industry-quarter for the period 1980-2012. The Fama-French 48 industry grouping is used. Each model is estimated for industry-quarter with at least 15 observations. The reporter coefficients are mean values of the coefficients across industry-quarter; t-statistics are in parentheses below each coefficient and calculated using the standard errors of the coefficients across industry-quarter. The R^2, adjusted R^2, and number of observations are the mean R^2, mean adjusted R^2, and the mean number of observations across industry-quarter, respectively

$$\frac{\text{Accruals}_{i,t}}{A_{i,t-1}} = \alpha_0 + \beta_1\left(\frac{1}{A_{i,t-1}}\right) + \alpha_2\left(\frac{\Delta\text{SALES}_{i,t}}{A_{i,t-1}}\right) + \alpha_3\left(\frac{\text{PPE}_{i,t}}{A_{i,t-1}}\right) + \varepsilon_{i,t} \quad (1)$$

$$\frac{\text{PROD}_{i,t}}{A_{i,t-1}} = \beta_0 + \beta_1\left(\frac{1}{A_{i,t-1}}\right) + \beta_2\left(\frac{\text{Sales}_{i,t}}{A_{i,t-1}}\right) + \beta_3\left(\frac{\Delta\text{Sales}_{i,t}}{A_{i,t-1}}\right) + \beta_4\left(\frac{\Delta\text{Sales}_{i,t-1}}{A_{i,t-1}}\right) + \mu_{i,t} \quad (2)$$

$$\frac{\text{DISX}_{i,t}}{A_{i,t-1}} = \gamma_0 + \gamma_1\left(\frac{1}{A_{i,t-1}}\right) + \gamma_2\left(\frac{\text{Sales}_{i,t-1}}{A_{i,t-1}}\right) + e_{i,t} \quad (3)$$

AM and RM_PROD are estimated studentized residual from equation (1) and (2) respectively; RM_DISX is the estimated residuals from equation (3) multiplied by -1; and RM is the sum of RM_PROD and RM_{DISX}.

In Panel B, we estimate the regressions to obtain unexpected abnormal levels of production costs, discretionary expenditures and unexpected total real earnings management.

$$\text{RM}_{i,t}\text{or RM\_PROD}_{i,t}\text{or RM\_DISX}_{i,t} = \delta_0 + \delta_1\text{Market\_Share}_{t-1} + \delta_2\text{Zscore}_{t-1} + \delta_3\text{Inst}_{t-1} + \delta_4\text{NOA}_{t-1} + \delta_5\text{Cycle}_{t-1} + \delta_6\text{LMC}_t + \delta_7\text{RNDR}_t + \delta_8\text{DEBTR}_t + \delta_9\text{MB}_t + \delta_{10}\text{ROA}_t + u_t \quad (4)$$

where RM, RM_PROD, and RM_DISX are the proxies for abnormal level of real activities manipulation. The constructs of the control variables in equation 4 are described in Appendix 1. U_RM, U_RM_PROD, and U_RM_DISX are the estimated studentized residuals from regressions in Panel B. *, ** and *** indicate the significance at 10%, 5%, and 1% level, respectively

Table 3 - Real activities manipulation around bond issuances

	RM_PROD(N=5,584)		*RM_DISX* (N=5,584)		*RM* (N=5,584)		*AM*(N=5,111)		*U_RM*(N=5,584)	
Relative Quarter	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median
-8	-0.010	-0.017	0.130	0.144	0.117	0.110	-0.021	-0.018	0.028	0.027
-7	-0.002	-0.014	0.132	0.147	0.129	0.120	-0.019	-0.013	0.048	0.036
-6	-0.011	-0.020	0.129	0.149	0.117	0.112	-0.026	-0.017	0.036	0.030
-5	-0.012	-0.017	0.127	0.143	0.114	0.117	-0.017	-0.009	0.033	0.032
-4	-0.008	-0.016	0.127	0.147	0.119	0.124	-0.014	-0.009	0.041	0.040
-3	-0.001	-0.006	0.128	0.141	0.127	0.121	-0.020	-0.013	0.046	0.042
-2	-0.008	-0.013	0.137	0.146	0.129	0.127	-0.001	0.000	0.042	0.041
-1	0.012	-0.008	0.129	0.141	0.144	0.124	0.000	0.007	0.052	0.049
0	0.022	0.002	0.126	0.144	0.150	0.133	0.007	0.005	0.060	0.042
1	0.005	0.000	0.145	0.150	0.148	0.142	-0.011	-0.005	0.053	0.047
2	0.005	-0.010	0.142	0.145	0.147	0.135	-0.008	-0.004	0.054	0.044
3	0.005	-0.009	0.155	0.150	0.160	0.146	-0.006	-0.001	0.057	0.043
4	-0.004	-0.009	0.149	0.152	0.145	0.131	-0.011	-0.007	0.047	0.040
5	0.000	-0.009	0.147	0.146	0.146	0.126	-0.017	-0.008	0.054	0.041
6	0.002	-0.005	0.142	0.145	0.144	0.131	-0.020	-0.009	0.052	0.035
7	0.000	-0.014	0.149	0.151	0.149	0.137	-0.015	-0.003	0.055	0.047
8	-0.008	-0.020	0.140	0.149	0.132	0.131	-0.020	-0.013	0.047	0.035
Mean (-8,-5)	-0.009	-0.008	0.128	0.143	0.118	0.121	-0.026	-0.024	0.035	0.032
Mean (-4,-1)	-0.001	0.000	0.130	0.141	0.130	0.129	-0.011	-0.010	0.045	0.038
Mean (+1,+4)	0.003	0.002	0.148	0.150	0.150	0.147	-0.011	-0.013	0.053	0.041
(-8,-5) vs. (-4,-1)	0.0083	0.0042	0.0026	-0.0030	0.0124	0.0010	0.0220	0.0152	0.0098	0.0030
	(1.98**)		(0.82)		(2.29**)		(4.23***)		(2.12**)	
(-4,-1) vs. (+4,+1)	0.0036	0.0014	0.0179	0.0071	0.0204	0.0079	-0.0005	0.0012	0.0088	0.0019
	(0.86)		(5.63***)		(3.69***)		(-0.09)		(1.98**)	

This table presents each individual real activities measure (*RM*, *RM_PROD*, *RM_DISX*, *U_RM_PROD*, and *U_RM_DISX*) and the accrual-based earnings measure (*AM*) around bond offerings. *, **, and *** indicate the significance at 10%, 5%, and 1% level, respectively.

Table 4 - Cross-Sectional Analysis of Real Activities Manipulation around Bond Issues

	Panel A - RM		***Panel B - URM***		***Panel C - AM***	
Indep. Vars.	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
DQ_{-8}	-0.008		-0.008		-0.007	
	(-1.773*)		(-2.101**)		(-1.560)	
DQ_{-7}	-0.007		-0.002		-0.007	
	(-1.712*)		(-0.637)		(-1.479)	
DQ_{-6}	-0.009		-0.006		-0.006	
	(-2.262**)		(-1.642)		(-1.196)	
DQ_{-5}	-0.011		-0.009		-0.005	
	(-2.967***)		(-2.600***)		(-0.978)	
DQ_{-4}	-0.009		-0.006		-0.004	
	(-2.725***)		(-1.732*)		(-1.166)	
DQ_{-3}	-0.005		-0.005		-0.001	
	(-1.645)		(-1.335)		(-0.162)	
DQ_{-2}	-0.006		-0.007		0.004	
	(-1.801*)		(-2.303**)		-0.945	
DQ_{-1}	-0.005		-0.004		0.003	
	(-1.638)		(-1.365)		-0.951	
DQ_{1}	0		-0.002		-0.006	
	(-0.091)		(-0.690)		(-1.929*)	
DQ_{2}	-0.004		-0.002		-0.007	
	(-1.528)		(-0.603)		(-1.693*)	
DQ_{3}	-0.001		-0.001		-0.005	
	(-0.378)		(-0.228)		(-1.371)	
DQ_{4}	-0.006		-0.005		-0.007	
	(-1.945*)		(-1.644)		(-2.076**)	
$DQ_{(-8,-5)}$		-0.015		-0.011		-0.011
		(-2.478**)		(-2.098**)		(-1.531)
$DQ_{(-4,-1)}$		-0.011		-0.01		0.001
		(-2.434**)		(-2.121**)		-0.184
$DQ_{(+4,+1)}$		-0.005		-0.004		-0.011
		(-1.206)		(-0.969)		(-2.167**)
U_RM					0.076	0.076
					(2.925***)	(2.926***)
LMC	-0.003	-0.003	-0.034	-0.034	-0.006	-0.006
	(-0.090)	(-0.090)	(-1.623)	(-1.623)	(-0.155)	(-0.153)
MB	-0.295	-0.295	-0.166	-0.166	-0.111	-0.111
	(-5.539***)	(-5.540***)	(-5.129***)	(-5.129***)	(-2.760***)	(-2.762***)
ROA	-0.051	-0.051	-0.034	-0.034	0.012	0.012
	(-2.824***)	(-2.824***)	(-2.942***)	(-2.942***)	-0.851	-0.85
$Market\_Share$	-0.056	0.056			-0.024	-0.024
	(-1.259)	(-1.259)			(-0.743)	(-0.745)
$Zscore$	-0.01	-0.01			0.032	0.032
	(-0.297)	(-0.297)			-1.087	-1.09
$Inst$	-0.005	-0.005			0.006	0.006
	(-0.524)	(-0.524)			-0.465	-0.463
MTR	0.033	0.033			0.012	0.012
	-1.563	-1.563			-0.623	-0.621
$Auditor8$	0.018	0.018			-0.036	-0.036
	-1.06	-1.06			(-2.951***)	(-2.952***)
SOX	-0.073	-0.073			0.038	0.037

	(-3.377***)	(-3.378***)			-1.641	-1.64
NOA	-0.008	-0.008			-0.001	-0.001
	(-0.426)	(-0.426)			(-0.119)	(-0.115)
Cycle	-0.039	-0.039			0.151	0.151
	(-1.726*)	(-1.726*)			(5.846***)	(5.847***)
RNDR	-0.001	-0.001			0.001	0
	(-1.020)	(-0.979)			-0.744	-0.736
DEBTR	0.038	0.038			0.028	0.028
	-1.444	-1.444			-0.801	-0.804
R-squared	0.107	0.107	0.038	0.038	0.043	0.043
F	6.776***	9.577***	4.550***	9.074***	4.754***	7.017***
Observations	47,891	47,891	68,736	68,736	47,848	47,848

This table presents the results of cross-sectional regressions of total real activities manipulation (Panel A), unexpected real activities manipulation (Panel B), and accrual-based earning management (Panel C). We estimate the following equations:

$RM_{i,j} or\ RM\_PROD_{i,j} or\ RM\_DISX_{i,j} = \delta_0 + \sum_{j=-8}^{4} \delta_{1,j} DQ_{i,j} + \delta_2 Market\_Share_{i,j-1} + \delta_3 Zscore_{i,j-1} + \delta_4 Inst_{i,j-1} + \delta_5 \mathrm{NOA}_{i,j-1} + \delta_6 \mathrm{Cycle}_{i,j-1} + \delta_7 \mathrm{LMC}_{i,j} + \delta_8 \mathrm{RNDR}_{i,j} + \delta_9 \mathrm{DEBTR}_{i,j} + \delta_{10} \mathrm{MB}_{i,j} + \delta_{11} \mathrm{ROA}_{i,j} + \varepsilon_{i,j}$

$U\_RM_{i,j} = \theta_0 + \sum_{j=-8}^{4} \theta_{1,j} DQ_{i,j} + \theta_2 \mathrm{LMC}_{i,j} + \theta_3 \mathrm{MB}_{i,j} + \theta_4 \mathrm{ROA}_{i,j} + \epsilon_{i,j}$

$AM_{i,j} = \vartheta_0 + \sum_{j=-8}^{4} \vartheta_{1,j} DQ_{i,j} + \vartheta_2 U\_RM_{i,j} + \vartheta_3 Market\_Share_{i,j-1} + \vartheta_3 Zscore_{i,j-1} + \vartheta_4 Inst_{i,j-1} + \vartheta_5 \mathrm{NOA}_{i,j-1} + \vartheta_6 \mathrm{Cycle}_{i,j-1} + \vartheta_7 \mathrm{LMC}_{i,j} + \vartheta_8 \mathrm{RNDR}_{i,j} + \vartheta_9 \mathrm{DEBTR}_{i,j} + \vartheta_{10} \mathrm{MB}_{i,j} + \vartheta_{11} \mathrm{ROA}_{i,j} + \omega_{i,j}$

where $RM_{i,j}\ and\ U\_RM_{i,j}$ are the abnormal and unexpected level of total real earnings management for firm we in quarter j respectively, and $AM_{i,j}$ is the discretionary accrual. DQ_i is a series of dummies variable that takes the value of 1 for each quarter before bond issue (-8, -1) and 0 otherwise Panel B run the model using a dummies for two intervals of time before firms issue debt, quarters (-8, -5) and (-4,-1). The constructs of the control variables are described in Appendix 1. *, ** and *** indicate the significance at 10%, 5%, and 1% levels, respectively. T-values are in parenthesis and are adjusted for firm-level clustering effects.

Table 5 - Orthogonalized credit rating regression

Variables	$\boldsymbol{Dependent\ Variable = YS}$
TA	1.948***
	(68.557)
ROA	11.454***
	(8.238)
$DEBT$	-5.626***
	(-27.517)
$Coll$	-0.616***
	(-4.178)
MB	1.282***
	(27.025)
RV	0.586***
	(9.294)
LP	-1.579
	(-0.828)
LM	-1.575***
	(-33.511)
Constant	6.113***
	(18.550)
R-squared	0.600
F	915.3***
Observations	4,893

This table presents the result of cross-sectional regression of the bond credit ratings using the following equation:

$$Rating_{i,j} = \alpha_0 + \alpha_1 LTA_{i,j} + \alpha_2 ROA_{i,j} + \alpha_3 DEBT_{i,j} + \alpha_4 MB_{i,j} + \alpha_5 RV_{i,j-1} + \alpha_6 Coll_{i,j} + \alpha_7 LP_{i,j} + \alpha_8 LM_{i,j} + \mu_{i,j}$$

where $Rating_{i,t}$ is the is the proceeds-weighted numerical credit ratings for each firm i in quarter *j*; $LTA_{i,j}$ is the natural logarithm of total asset for firm i in quarter *j*, since larger firms tend to be less risky and can enjoy lower costs of debt; $ROA_{i,j}$ is the return on asset computed as the ratio of net income to total assets for firm i in quarter *j*; $DEBT_{i,j}$ is the of total debt to total assets for firm i in quarter *j*; $MB_{i,j}$ is the market value of asset divided by book value of assets for firm i in quarter *j*; $Coll_{i,j}$ is firm collateral measured as the ratio of property, plan, and equipment to total assets, firms with greater collateral present lower risk to investors and are expected to have a lower cost of debt for firm i in quarter *j*; $RV_{i,j}$ is the variance of daily stock returns in the quarter preceding the bond issuance, since equity volatility is related to the cost of debt for firm i in quarter *j*; $LP_{i,j}$ is the natural logarithm of total proceeds of the bond issue for firm i in quarter *j*; $LM_{i,j}$ is the natural logarithm of the number of quarter to bond maturity for firm i in quarter *j*. If a firm has more than one bond issue in a quarter $LP_{i,j}$ and $LM_{i,j}$ are proceeds-weighted. *, ** and *** indicate the significance at 10%, 5%, and 1% levels, respectively. T-values are in parenthesis and are adjusted for firm-level clustering effects.

Table 6 - Cross-Sectional Regressions of Yield Spreads on Real Activities Manipulation and Accrual-Based Earnings Management

Variables	***Model* 1**	***Model* 2**	***Model* 3**	***Model* 4**	***Model* 5**	***Model* 6**
RM_{t-1}	-0.057**					
	(-2.253)					
$RM_{mean(-4,-1)}$		-0.078**				
		(-2.493)				
AM_{t-1}			0.081		0.082	
			(1.636)		(1.011)	
$AM_{mean(-4,-1)}$				0.084		0.084
				(1.486)		(1.348)
U_RM_{t-1}					-0.022	
					(-0.409)	
$U\_RM_{mean(-4,-1)}$						-0.009
						(-0.165)
TA	-0.743***	-0.741***	-0.764***	-0.765***	-0.765***	-0.765***
	(-31.762)	(-31.711)	(-30.903)	(-30.808)	(-14.614)	(-19.749)
ROA	-10.078***	-10.004***	-10.198***	-10.083***	-10.243***	-10.091***
	(-9.139)	(-9.187)	(-9.567)	(-9.430)	(-4.578)	(-5.939)
$DEBT$	2.023***	2.034***	2.116***	2.123***	2.116***	2.123***
	(11.572)	(11.586)	(11.613)	(11.665)	(9.417)	(10.039)
$Coll$	0.190	0.191	0.200*	0.199	0.200	0.199
	(1.574)	(1.583)	(1.655)	(1.644)	(1.101)	(1.373)
MB	-0.600***	-0.607***	-0.577***	-0.578***	-0.579***	-0.580***
	(-16.366)	(-16.487)	(-15.934)	(-15.966)	(-7.455)	(-10.484)
RV	2.754**	2.752**	2.691**	2.698**	2.691**	2.697**
	(1.978)	(1.971)	(2.006)	(2.007)	(2.541)	(2.050)
LP	0.805***	0.804***	0.848***	0.848***	0.848***	0.848***
	(20.241)	(20.291)	(20.866)	(20.875)	(8.810)	(12.867)
LM	-0.405***	-0.404***	-0.420***	-0.419***	-0.419***	-0.418***
	(-8.569)	(-8.548)	(-9.492)	(-9.497)	(-4.387)	(-6.538)
$Rating$	-0.331***	-0.332***	-0.348***	-0.348***	-0.348***	-0.348***
	(-31.482)	(-31.524)	(-31.636)	(-31.622)	(-13.556)	(-18.587)
Constant	5.007***	5.005***	4.864***	4.862***	4.868***	4.863***
	(19.054)	(19.050)	(18.552)	(18.614)	(10.196)	(12.445)
Adj R^2	0.586	0.587	0.600	0.599	0.599	0.599
F-statistics	218.8***	218.9***	212.9***	212.0***	385.2***	479.1***
Observations	4,893	4,893	4,494	4,494	4,493	4,494

This table reports the cross-sectional regressions of the yield spread: $YS_{i,j} = \gamma_0 + \gamma_1 EM_{i,j-1} + \gamma_2 LTA_{i,j} + \gamma_3 ROA_{i,j} + \gamma_4 DEBT_{i,j} + \gamma_5 MB_{i,j} + \gamma_6 RV_{i,j-1} + \gamma_7 Coll_{i,j} + \gamma_8 LP_{i,j} + \gamma_9 LM_{i,j} + \gamma_{10} Rating_{i,j} + \xi_{i,j}$, where $YS_{i,t}$ is the proceeds-weighted bond yield spread for each firm i in quarter *j*; $EM_{i,j-1}$ is one of the measures of real activities manipulations for firm i in quarter *j-1*; $LTA_{i,j}$ is the natural logarithm of total asset for firm i in quarter *j*, since larger firms tend to be less risky and can enjoy lower costs of debt; $ROA_{i,j}$ is the return on asset computed as the ratio of net income to total assets for firm i in quarter *j*; $DEBT_{i,j}$ is the of total debt to total assets for firm i in quarter *j*; $MB_{i,j}$ is the market value of asset divided by book value of assets for firm i in quarter *j*; $Coll_{i,j}$ is firm collateral measured as the ratio of property, plan, and equipment to total assets - firms with greater collateral present lower risk to investors and are expected to have a lower cost of debt for firm i in quarter *j*; $RV_{i,j}$ is the variance of daily stock returns in the quarter preceding the bond issuance, since equity volatility is related to the cost of debt for firm i in quarter *j*; $LP_{i,j}$ is the natural logarithm of total proceeds of the bond issue for firm i in quarter *j*; $LM_{i,j}$ is the natural logarithm of the number of quarter to bond maturity for firm i in quarter *j*. If a firm has more than one bond issue in a quarter $LP_{i,j}$ and $LM_{i,j}$ are proceeds-weighted. $Rating_{i,j}$ is the proceeds-weighted numerical credit ratings orthogonalized to other control variables in the regression for firm i in quarter *j* in Table 5. *, ** and *** indicate the significance at 10%, 5%, and 1% levels, respectively. T-values are in parenthesis and are adjusted for firm-level clustering effects.

Table 7 – Robustness Regressions 1 –Three-Stage Least Squares Regressions

Variables	*Dependent variable = YS*	*Dependent variable = RM*

RM_{t-1}	-0.979***	
	(-5.747)	
YS_{t-1}		0.022
		(1.117)
TA	-0.692***	
	(-28.906)	
ROA	-14.460***	
	(-13.418)	
$DEBT$	2.453***	
	(16.622)	
$Coll$	0.078	
	(0.789)	
MB	-0.748***	
	(-12.859)	
RV	2.156**	
	(2.224)	
LP	0.775***	
	(24.970)	
LM	-0.347***	
	(-8.690)	
$Rating$	-0.336***	
	(-32.839)	
$Zscore$		-0.163***
		(-11.271)
LMC		0.029**
		(2.282)
$Auditor8$		0.426***
		(3.227)
ARM		0.100***
		(4.228)
SOX		-0.204***
		(-5.089)
Cycle		0.000
		(0.419)
NOA		-0.000
		(-0.549)
Constant	4.730***	-0.278
	(17.706)	(-1.517)
R-squared	0.442	0.062
χ^2	3,581***	231.4***
Observations	2,989	2,989

This table presents the regression results using a subsample of pure bond issuances (e.g. simultaneous bond and equity issuances are excluded) in Panel A and the regression results of a system of structural equation using three-stage least squares model (in Panel B) using the following equations:

$$YS_{i,j} = \beta_0 + \beta_1 EM_{i,j-1} + \beta_2 LTA_{i,j} + \beta_3 ROA_{i,j} + \beta_4 DEBT_{i,j} + \beta_5 MB_{i,j} + \beta_6 RV_{i,j-1} + \beta_7 Coll_{i,j} + \beta_8 LP_{i,j} + \beta_9 LM_{i,j} + \beta_{10} Rating_{i,j} + \xi_{i,j}$$

$$RM_{i,t} = \vartheta_0 + \vartheta_1 MI_{i,t-1} + \vartheta_2 Zscore_{i,t} + \vartheta_3 BIG8_{i,t} + \vartheta_4 ARM_{i,t} + \vartheta_5 SOX_{i,t} + \vartheta_6 Cycle_{i,t} + \vartheta_7 NOA_{i,t} + \varphi_{i,t}$$

$YS_{i,t}$ is the proceeds-weighted bond yield spread for each firm i in quarter *j*;
$EM_{i,j-1}$ is one of the measures of real activities manipulations for firm i in quarter *j-1*;
$LTA_{i,j}$ is the natural logarithm of total asset for firm i in quarter *j*, since larger firms tend to be less risky and can enjoy lower costs of debt;
$ROA_{i,j}$ is the return on asset computed as the ratio of net income to total assets for firm i in quarter *j*; $DEBT_{i,j}$ is the of total debt to total assets for firm i in quarter *j*; $MB_{i,j}$ is the market value of asset divided by book value of assets for firm i in quarter *j*; $Coll_{i,j}$ is firm collateral measured as the ratio of property, plan, and equipment to total assets. Firms with greater collateral present lower risk to investors and are

expected to have a lower cost of debt for firm i in quarter *j*; $RV_{i,j}$ is the variance of daily stock returns in the quarter preceding the bond issuance, since equity volatility is related to the cost of debt for firm i in quarter *j*; $LP_{i,j}$ is the natural logarithm of total proceeds of the bond issue for firm i in quarter *j*; $LM_{i,j}$ is the natural logarithm of the number of quarter to bond maturity for firm i in quarter *j*. If a firm has more than one bond issue in a quarter $LP_{i,j}$ and $LM_{i,j}$ are proceeds-weighted. $Rating_{i,j}$ is the proceeds-weighted numerical credit ratings orthogonalized to other control variables in the regression for firm *i* in quarter *j*. $RM_{i,t}$ is the total real activities manipulation; $Zscore_{i,t}$ is the Z score, $BIG8_{i,t}$ indicator variable that equals to one if the firm's auditor is one of the eight largest accounting firms and zero otherwise, $ARM_{i,t}$ is the absolute value of total real activities manipulation, $SOX_{i,t}$ is a dummy variable for pre and post-Sarbanes-Oxley (*SOX*), $Cycle_{i,t}$ is a measure of the length of the firm's operating cycle, $NOA_{i,t}$ is a dummy variable for firms with relatively high net operating assets to sales at the start of the quarter. *, ** and *** indicate the significance at 10%, 5%, and 1% levels, respectively. T-values are in parenthesis and are adjusted for firm-level clustering effects.

Table 8 – Robustness Regressions 2 – Regressions by Subsamples

Variables	*Small issue size (1)*	*Large issue size (2)*	*Short maturity issues (3)*	*Long maturity issues (4)*	*Noninvestment bonds (5)*	*Investment bonds (6_*	*Small issuers (7)*	*Large issuers (8)*	*Low earnings volatility issuer (9)*	*High earnings volatility issuers (10)*
$RM_{mean(-4,-1)}$	-0.099**	-0.018	-0.075**	-0.086**	0.028	-0.079**	-0.061	-0.079*	-0.061	-0.079*
	(-2.421)	(-0.462)	(-2.014)	(-2.413)	(0.485)	(-2.464)	(-1.484)	(-1.830)	(-1.484)	(-1.830)
TA	-0.471***	-0.918***	-0.826***	-0.459***	-0.849***	-0.242***	-0.811***	-0.449***	-0.811***	-0.449***
	(-8.989)	(-14.421)	(-19.665)	(-11.536)	(-12.157)	(-6.589)	(-14.730)	(-10.133)	(-14.730)	(-10.133)
ROA	-6.417***	-9.488***	-10.639***	-2.432*	-9.606***	-3.168*	-10.634***	-6.412***	-10.634***	-6.412***
	(-3.227)	(-5.605)	(-6.041)	(-1.775)	(-5.305)	(-1.712)	(-5.266)	(-2.924)	(-5.266)	(-2.924)
$DEBT$	1.177***	2.240***	2.292***	1.138***	2.298***	0.859***	2.366***	1.215***	2.366***	1.215***
	(3.961)	(13.679)	(10.460)	(4.904)	(9.188)	(4.795)	(10.645)	(4.791)	(10.645)	(4.791)
$Coll$	-0.059	0.283*	0.263	-0.039	0.471**	-0.065	0.283	0.188	0.283	0.188
	(-0.430)	(1.808)	(1.643)	(-0.324)	(2.483)	(-0.688)	(1.526)	(1.494)	(1.526)	(1.494)
MB	-0.402***	-0.842***	-0.671***	-0.340***	-1.129***	-0.306***	-1.045***	-0.370***	-1.045***	-0.370***
	(-8.606)	(-10.945)	(-10.143)	(-7.193)	(-8.040)	(-8.358)	(-8.800)	(-9.012)	(-8.800)	(-9.012)
RV	800.029***	1.984**	2.459**	452.986***	1.721**	886.513***	1.916**	470.919**	1.916**	470.919**
	(5.441)	(2.277)	(2.083)	(5.075)	(2.266)	(4.613)	(2.242)	(2.334)	(2.242)	(2.334)
LP	0.467***	1.118***	0.924***	0.445***	0.910***	0.336***	0.995***	0.543***	0.995***	0.543***
	(7.377)	(14.122)	(12.655)	(8.680)	(9.002)	(5.743)	(13.599)	(7.704)	(13.599)	(7.704)
LM	-0.122**	-0.932***	-0.772***	-0.180**	-2.393***	-0.002	-0.732***	-0.126**	-0.732***	-0.126**
	(-2.101)	(-6.500)	(-5.388)	(-2.433)	(-7.070)	(-0.036)	(-5.467)	(-2.012)	(-5.467)	(-2.012)
$Rating$	-0.222***	-0.345***	-0.364***	-0.199***	-0.363***	-0.109***	-0.385***	-0.202***	-0.385***	-0.202***
	(-9.843)	(-17.181)	(-18.262)	(-13.130)	(-10.287)	(-6.272)	(-18.240)	(-9.341)	(-18.240)	(-9.341)
Constant	3.464***	5.985***	5.715***	3.642***	10.166***	1.528***	5.706***	2.775***	5.706***	2.775***
	(7.261)	(13.408)	(10.563)	(8.049)	(11.243)	(4.968)	(9.709)	(5.416)	(9.709)	(5.416)
Adj R2	0.492	0.570	0.589	0.585	0.324	0.302	0.586	0.453	0.586	0.453
F-statistics	96.94***	307.5***	415.7***	110.8***	58.75***	68.61***	336.1***	140.0***	336.1***	140.0***
Observations	2,575	2,318	3,674	1,219	1,719	3,174	2,287	2,606	2,287	2,606

This table presents the regression results the subsamples of small (large) issues that have issue proceeds (relative to total assets) below (above) the median issue in the sample, of short (long) maturity issues that have years to maturity below (above) the median issue in the sample, of investment bond (bonds with rating greater than 12) and noninvestment bond subsample (debt with rating less than 13), of small (large) issuers that have market value of equity below (above) the median firm in the sample and of low (vs. high) earnings volatility (high) issuers.

Figure 1 - Total real activities manipulation (RM) around Bond Issuances

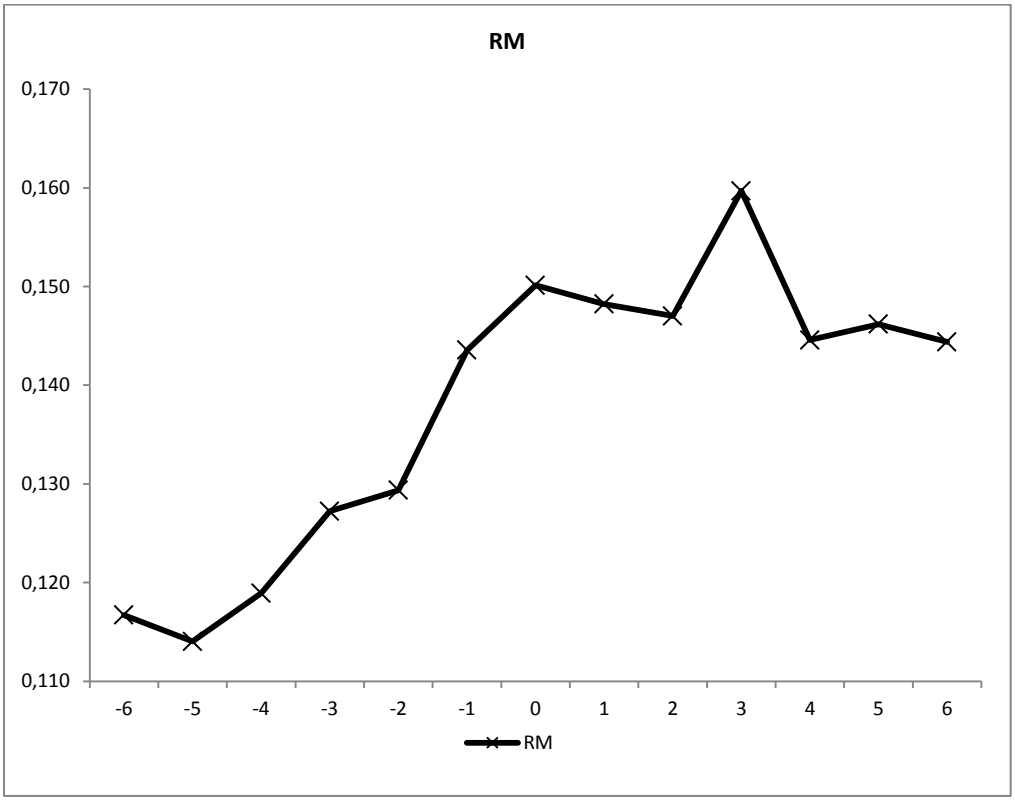
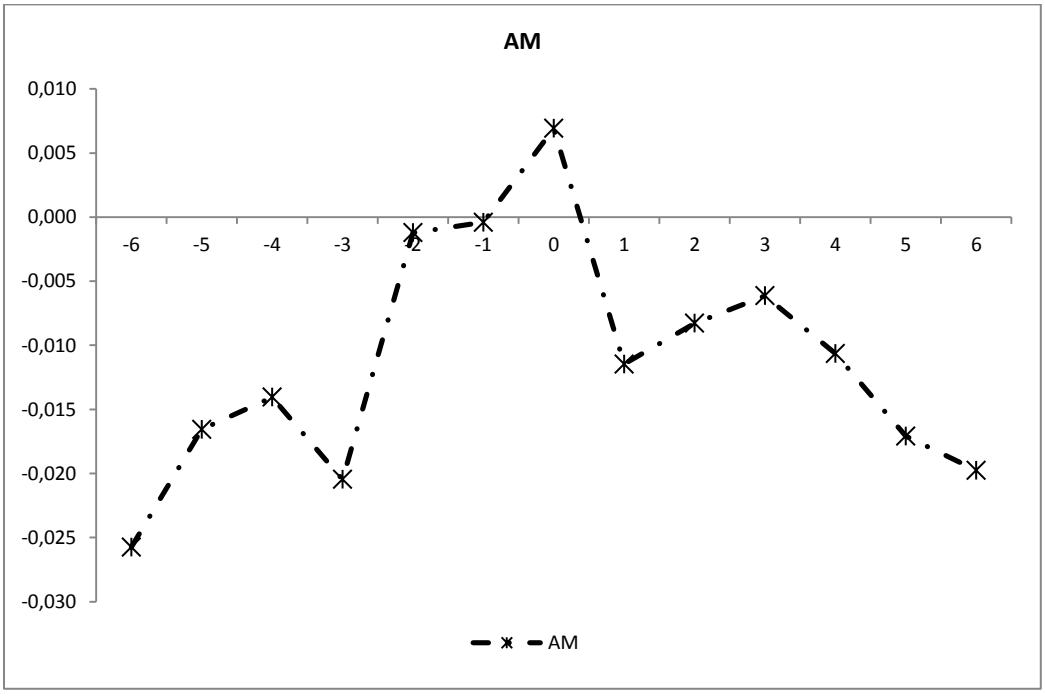


Figure 2 – Accruals-Based Earnings Management (AM) around Bond Issuances



Appendix 1 – Control variable constructions (Equation 4)	
Variables	**Constructions**
Market share $Market\_Share_{i,t-1}$	Market share measures firm's market leader status in the industry at the beginning of the quarter; it is the ratio of company's sales to total sales of its industry. We define industry using 3-digit SIC codes as in Harris (1998).
Zscore $Zscore_{i,t-1}$	Z-score is a modified version of Altman's Z-score (Altman 1968; Altman 2000) that proxies for a firm's financial condition and is widely used by the financial industry and finance research (Allayannis et al. 2003; Bartram et al. 2009; Larkin 2013). Higher values of Z-score indicate a healthier financial condition and a lower cost associated with real activities manipulations. we calculate Z-score as follows: $\text{Zscore}_{i,t} = 0.3\frac{NI_{i,t}}{A_{i,t}} + 1.0\frac{Sales_{i,t}}{A_{i,t}} + 1.4\frac{Retained\ Earnings_{i,t}}{A_{i,t}} + 1.2\frac{Working\ Capital_{i,t}}{A_{i,t}} + 0.6\frac{(Stock\ Price\ x\ Shares\ Outstanding)_{i,t}}{Total\ Liabilities_{i,t}}$ where $NI_{i,t}$ is the net income in quarter t, and $A_{i,t}$ is the total asset in quarter t. Using discriminant analyses, Altman (2000) tests different factors that affect the credit risk of a firm and derives that the weights in the above formula for the Z-score. We use Z-score at the beginning of the quarter to capture the cost of real activities manipulation.
Institutional ownership $Inst_{i,t-1}$	Institutional ownership is measured by the number of institutional investors reported in form 13F. A high value of institutional ownership indicates high costs of real activities manipulation due to the monitoring role of institutional owners.
Net operating asset $\text{NOA}_{i,t-1}$	We estimate the net operating assets (NOA) at the beginning of the quarter as: $\text{NOA}_{i,t} = \frac{Shareholders'Equity_{i,t} - Cash\ and\ Marketable\ Securities_{i,t} + Total\ Liabilities_{i,t}}{Sales_{i,t}}$ NOA is a proxy for the extent of accrual management in previous period. NOA is higher when the firm engages in accrual manipulation in previous periods. The cost of accrual management in the current period is positively related to the extent of excessive NOA at the beginning of the quarter. We create the dummy equal to 1 when the NOA is above the median of the corresponding industry-quarter, and zero otherwise. We calculate the length of the firm's operating cycle as the days receivable plus the days inventory less the day payables at the beginning of the quarter. Firms with longer operating cycles have greater flexibility for accrual management because they have larger accrual accounts and longer periods for accruals to reverse.
Return on assets (ROA)	We control for firms' return on assets (ROA) computed using net income for the rolling four quarters to capture firm performance.
Firm size (LMC)	We use the natural logarithm of market capitalization (LMC) to control for firm size; there is more informational asymmetry associated with larger firms, which facilitates more earnings management by managers.
Research and development expenses (RNDR)	As suggested by Jiraporn *et al.* (2008), we use the ratio of research and development expenses to total sales (RNDR) to control for the level of informational asymmetry.
Market to book ratio (MB)	We use market to book ratio (MB) to control for firms' growth prospect.
Leverage (DEBTR)	We control for financial leverage using the ratio total debt to total asset (DEBTR) because it is more difficult to manipulate earnings when the firms have more debts (Rodríguez-Pérez & van Hemmen 2010)

Appendix 2: Bond Rating Numerical Conversions

This table is borrowed from Table 1 of Klock *et al.* (2005) page 704 and provides the bond rating conversion codes for the Moody's and S&P ratings.

Conversion Number	Ratings	
	Moody's	**S&P**
22	Aaa	AAA
21	Aa1	AA^{+}
20	Aa2	AA
19	Aa3	AA^{-}
18	A1	A^{+}
17	A2	A
16	A3	A^{-}
15	Baa1	BBB^{+}
14	Baa2	BBB
13	Baa3	BBB^{-}
12	Ba1	BB^{+}
11	Ba2	B^{+}
10	Ba3	BB^{-}
9	B1	B^{+}
8	B2	B^{+}
7	B3	B^{-}
6	Caa1	CCC^{+}
5	Caa2	CCC
4	Caa3	CCC^{-}
3	Ca	CC
2	C	C
1	D	D

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