Accounting Restatements and the Cost of Debt Capital

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ABSTRACT

This is the first study that examines the bond market reactions to accounting restatement announcements and the impact of the announcements on the cost of restating firms' new bond issues. We document that the bonds of restating firms on average react negatively to the restatement news. Cross-sectional analysis of bond market reactions indicates that the magnitude of negative excess bond returns is significantly greater for the restating firms that experience more severe accounting restatements in terms of dollar amounts and the fraudulent nature of restatements, or whose restatements are prompted by the firms themselves, or whose bonds have shorter maturities. Moreover, we find that the restating firms pay higher risk premiums for new bonds issued subsequent to the restatements relative to new bonds issued prior to the restatement events. The findings of this study fill a void in the existing restatement literature that has focused exclusively on the stock market reactions by examining the economic consequences of accounting quality changes in the bond market.

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1. Introduction

On Feb 24, 2003, Ahold, a global retailer listed on the NYSE, rocked the market by announcing that it had overstated its earnings in 2001 and 2002 by at least $500 million. The news sent its stock plummeting by 65% the next trading day. The price of its 5.875 percent bond fell from $99.45 to $75.63 on the same day, and bond trading was suspended for a few days. When trading resumed, the price dived further to $62.44. Ahold presents a powerful case showing that bondholders were not immune to the adverse effects of accounting restatements[1].

Accounting restatements became more common in the late 1990s and the number of restatements grew rapidly in the early 2000s (Wu 2002; GAO 2003). The prevalence of restatements have raised great concerns among regulators, legislators, and investors regarding the quality of accounting information of public U.S. companies and adverse effects on the U.S. capital markets (GAO 2002; Levitt 1998).

Several recent accounting papers have examined the stock market effects of accounting restatements in terms of shareholder value loss, cross-sectional determinants of the stock market reaction, and the impact on the equity cost of capital (e.g., Palmrose et al. 2004; Hribar and Jenkins 2004). However, the existing studies have focused on the stock market only. Anecdotal evidence such as Ahold and Waste Management notwithstanding, little is known about the economic consequences of restatements in the bond market.

[1] Another anecdote involves Waste Management. The company's bond prices experienced a large drop following its restatement announcements on August 3, 1999.

This study fills a gap in the restatement literature by examining the impact of restatement announcements on restating firms' seasoned bond prices and on the risk premiums of their new bond issues. Specifically, it examines the following questions: (1) What is the bond market reaction to the restatement announcements? (2) What factors explain the cross-sectional variation of excess bond returns for different seasoned bonds? (3) Do restating firms damage their reputation in the bond market and therefore pay higher risk premiums for their new bond issues after their restatement announcements?

The theoretical motivation for this study is several folds. First, equity and debt are two fundamentally different securities. For example, in the classical option-pricing framework (Merton 1974), the risk and uncertainty from restatements are expected to have opposite effects on the equity and debt valuations. Therefore, the results from the stock market cannot be generalized to the bond market. Second, unlike stock, bond usually comes with several features, such as maturity, call option, put option, and credit enhancement. The presence of these features complicates the restatement effects on bond pricing. Lastly, the corporate bond market is much larger in size than the stock market,[2] the sheer size of the bond market gives rise to the importance of understanding the bond market consequences of restatements.

Our analysis of the bond market reaction to restatement news utilizes a sample of 137 *seasoned* bonds of 50 firms that restated their financial statements from 1997 to 2003. We document an average significant and negative excess bond return around the

[2] U.S. corporate debt financing exceeds equity financing over a long time period. Bhojraj and Sengupta (2003) report that in 1996, the value of new corporate bond issues was $651 billion (versus $122 billion in new stock issues). In 1998, the value of new bond issues was $1,001 billion (versus $126 billion in new stock issues). In 2004, corporations issued $1.2 trillion in straight bonds versus $146 billion raised in common stocks (Thomson First Call 2004).

restatement announcements. Cross-sectional analysis of the bond market reaction shows that the magnitude of negative excess bond returns is greater for the firms that restated larger amounts of earnings, and whose restatements involved a larger number of years, resulted from accounting frauds or were prompted by the firms themselves. Additional sensitivity analyses show that our findings are unlikely caused by potentially confounding news events such as bankruptcy announcements, dividend changes, quarterly earning surprises and class action suits, and are robust to shorter event windows and alternative bond event study methodologies.

To provide a further insight on the effect of restatements on the cost of debt, we examine the change in risk premiums of new bond issues following the restatement news. An important advantage of using new bond issues is that it provides direct evidence on the impact of restatement news on the *actual* cost of bond financing incurred by the firms. Using a separate, larger sample of 193 new bonds issued by 79 firms from 1997 to 2003, we document that relative to the bonds issued prior to the restatements, the restating firms pay higher risk premiums for *bonds* issued after the restatements, controlling for other determinants of bond risk premiums. The finding is consistent with the argument that restatement events lower the perceived quality of accounting information of the restating firms, increase the perceived risk of these firms, consequently resulting in higher risk premiums demanded by bondholders.

The reminder of the paper is organized as follows. Section 2 reviews the relevant literature and introduces the hypotheses. Section 3 discusses the data, sample, measures, methodology, and results for seasoned bonds. Section 4 covers the data, sample, measures, methodology, and results for newly issued bonds. Section 5 presents the robustness tests for seasoned bonds. Section 6 presents concluding remarks

2. Literature Review and Hypotheses Development

2.1. Restatement Impact on Bonds

Our first hypothesis draws from the theoretical model on bond valuation. Merton (1974) creates a theoretical model in which one firm has only two types of securities: one single bond and one type of stock. The total firm value (V) is the sum of the market values of both the equity and the bond. The equity can be viewed as a call option on the total firm value V (the underlying asset in option modeling), and its value can be derived from the option pricing model (Black and Scholes 1973). Thus, the bond value is the difference between total firm value (V) and total equity value. The bond pricing model predicts that the bond value is positively associated with total firm market value and negatively associated with the volatility of return on the firm's assets (σ^2) and the risk-free rate (r). Accounting restatements impact bond values through both the mean effect and the variance effect. First, they change the historical earnings and, in most cases, lower investors' expectations for future cash flows. The reduction in expected future cash flows will then affect V negatively. Second, restatement announcements also increase the perceived information risk on firm operation and thus the volatility of returns on the firm assets (σ^2)[3].

[3] In some empirical studies, the volatility of returns on firm assets (σ^2) before and after one event date is proxied by the variance of the error term from the market model regression with equity daily returns for the 125 days before and after the event date, respectively. For the 50 firms in my seasoned bond sample, 49 firms have sufficient trading price information for calculating the volatility of returns on firm assets before and after their restatement announcements. The means of the volatility of returns on firm assets before and after restatement announcements are 0.0019 and 0.0078, respectively, with the post-

In sum, the aggregate effect of restatement announcements on bond values is expected to be negative.

Hypothesis 1: On average, bond prices react negatively to firms' restatement announcements.

2.2. Determinants of Bond Market Reactions to Restatement Announcements

2.2.1. Restatement Materiality

Merton (1974) shows that bond market value is positively associated with total market value (V), while total firm value is determined by discounted future cash flows (Brealey and Myers 2003). Since historical earnings are positively correlated with future cash flows (Dechow 1994), there should be a positive association between historical earnings and bond prices. Thus, adjustments of historical earnings (amount of earnings restated) should be positively associated with bond price changes. Consistent with Palmrose et al. (2004), our first measure of restatement materiality is the amount of earnings restated[4] (deflated by total assets from the most recent quarter just before the restatement announcement), which is expected to be positively associated with excess bond returns. Our second measure of restatement materiality is the number of years restated as used in Palmrose et al. (2004). Unintentional

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announcement mean significantly larger than the pre-announcement mean at the 10% level. Here, the small sample size reduces the power of the mean test. In the next step, I test the same hypothesis with all restating firms from 1997 to 2003. This time, the mean post-announcement volatility of returns on firm assets (0.00638) is significantly larger than the mean pre-announcement (0.00296) at the 1% level. Therefore, I conclude that on average, the volatility of returns on firm assets increases after restatement announcements.

[4] The amount of earning restated is equal to restated income (loss) less originally reported income (loss) over restatement period, scaled by the book value of total assets for the fiscal quarter prior to the restatement announcement. If one firm overstated its earnings in the past, then the amount of earnings restated is negative. If the bond prices of the restating firm react negatively, then the coefficient for the amount of earnings restated in the regression should be positive, as reported in Palmrose et al. (2004).

accounting mistakes should be discovered quickly, through either the internal control process or external auditing. The need for a firm to restate its numbers several years from the past often suggests either long-term earning manipulations and/or serious corporate governance deficiencies. This second measure captures another dimension of restatement materiality and should also be incorporated into the analysis.

Hypothesis 2a: Abnormal bond returns are positively associated with the amount of earnings restated and negatively associated with the number of years restated.

2.2.2. Fraud

Restating firms with accounting fraud impair the confidence of both equity and bond investors more than non-fraudulent restating firms, because their accounting reports will be perceived as much less credible. Investors will expect greater uncertainty about the future operations of fraudulent firms. In addition, fraud will bring about more firm value loss since fraudulent firms are more likely to face expensive litigations (Palmrose and Scholz 2004; Bonner et al. 1998) and go through costly internal restructurings and management changes in the future (Feroz et al. 1991). In sum, we expect that bonds from both fraudulent restating firms and non-fraudulent restating firms will experience negative excess returns in the restatement announcement event window, but the former will have more negative returns than the latter. Here, we follow Palmrose et al. (2004) and rely on news reports in the event window to determine the existence of accounting fraud. The firm will either admit fraud in their past accounting practices in a press release, or the major business news agencies will present their analyses and conclude whether fraudulent accounting is involved.

Hypothesis 2b: Excess returns of bonds from fraudulent firms are associated with more negative returns than the excess returns of bonds from non-fraudulent firms.

2.2.3. Bond Maturity

Merton's model implicitly assumes that the total assets of a firm are reported without error, and that the boundary of bankruptcy can be known with certainty. Such an assumption is not true in reality, where accounting numbers reflect accounting recognition principles and can also be managed under various management incentives and outside constraints. Duffie and Lando (2001) capture such inaccuracy in reported asset numbers and incorporate accounting information quality into credit risk models. Their simulation results show that when there is a sudden decline in information precision, the credit spread on these seasoned bonds will escalate for bonds of short maturities, but change less for bonds with longer maturities.[5] Accounting restatements provide a useful setting to test this theoretical prediction. Restatement announcements send a clear message to bondholders to adjust their perceived precision of reported asset values. Therefore, we conjecture that seasoned bonds with relatively short maturities (less than two years) will have larger credit spread increases and thus experience more negative returns than bonds with longer maturities.

Hypothesis 2c: Ceteris paribus, for restating firms, excess bond returns around restatement announcements for bonds with terms to maturity less than two years will be more negative than excess bond returns of longer term to maturity bonds.

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[5] Simulation graph is in Appendix 3. The horizontal axis is in log-scale.

2.3. Risk Premiums on New Bond Issues

Our last hypothesis concerns the relation between the cost of debt capital and accounting information quality, and the test is based on newly issued bonds. In the accounting literature, accounting quality has been measured with disclosure ratings or discretionary accruals. Firms with higher disclosure quality are found to have lower effective interest costs on new bond issues (Sengupta, 1998) and private debt issues (Mazumdar and Sengupta 2005). In a recent study, Francis et al. (2005) show that firms with lower standard deviation of discretionary accruals are associated with lower costs of equity and debt capital. We therefore expect that risk premiums on new bond issues after restatement announcements will be higher than those of new bonds issued before the announcements. This conjecture is also supported by Merton (1974). The model shows that the risk premium (R- r) is positively associated with the volatility of return on firm assets (σ^2), and the leverage ratio with the total firm value (V) as the denominator. Rational bond investors will perceive a higher volatility of asset returns for restating firms after restatement announcements. As mentioned in hypothesis 1, on average, the total firm value (V) is also expected to decrease and the leverage ratio is expected to increase. Therefore, future bond investors will demand a higher risk premium for post-announcement new bond issues.

Hypothesis 3: New bond issues of restating firms after restatement announcements have higher risk premiums than new issues before restatement announcements.

3. Analysis of the Bond Market Reaction

3.1. Sample Selection

We obtained an initial list of restating firms from the GAO (2003) and by hand collection. The GAO (2003) includes restatement announcements from January 1, 1997 through June 30, 2002; their data collection stopped in the middle of 2002 and did not include 159 restatement announcements in the second half of that year. In its study, the GAO "excluded restatements resulting from mergers and acquisitions, discontinued operations, stock splits, issuance of stock dividends, currency-related issues, changes in business segment definitions, changes due to transfers of management, changes for presentation purposes, general accounting changes under GAAP, litigation settlements, and arithmetic and general bookkeeping errors" and restatements from normal accounting policy changes. The GAO staff claimed that they "focused on financial restatements resulting from accounting irregularity." Following the same criteria, we searched the *Factiva* database for new restatement announcements for the period from July 1, 2002 to December 31, 2003 (We also use the same key words such as "restate", "restated", "restatements", "restates" and "restating" to search restatement announcements).

There are 919 restatement announcements in the GAO dataset. We manually collected 159 announcements for the second half of 2002 and 221 announcements for 2003. Therefore, the total of announcements in 1997-2003 is 1,299. Among them, 194 observations are deleted since they are missing from Compustat, and 55 observations (for 55 firms) are deleted since these firms restated previous statements in compliance with SAB 101.[6] The reduced restatement sample includes 1,050 observations from 875 unique firms. For firms with multiple announcements, we keep only the first restatement announcement for each firm in the sample to avoid the compounding effect of early restatement announcements. This step reduces the sample size further to 875 observations.

The historical accounting information of restating firms comes from Compustat and press releases from restating firms, while treasury bond prices are extracted from CRSP. The corporate bond trading prices come from the National Association of Insurance Commissioners (NAIC) transactions database (1997-2003), which contains information about all bond transactions by life insurance companies, property and casualty insurance companies, and Health Maintenance Organizations (HMOs). It is distributed by Professor Warga (Warga 2000) and is an extension to the old dataset (Warga 1998) used by Duffee (1998), Blume et al. (1998), and Collin-Dufresne et al. (2001). New TRACE bond trading prices are available after June 2002. TRACE is perceived to be more comprehensive in coverage than the NAIC database. We mainly rely on NAIC dataset for trading prices, supplementing additional trading information with TRACE prices[7]. Since most corporate bonds are not traded

[6] Rechecking the GAO dataset, I noticed that the GAO authors included restatements due to the implementation of SAB 101. The full name of SAB 101 is Staff Accounting Bulletin 101, which was issued in December 1999. This SAB modified revenue recognition criteria and made revenue recognition more stringent than before. I excluded SAB 101 firms based on the following reasons: 1) most firms went through this transition by cumulative adjustments rather than historical restatements. The former method is usually used to comply with accounting standard changes, and 2) no firms were sued in the class action suits after their restatement announcement to comply with SAB 101. In sum, the implementation of SAB 101 should be treated as a change in accounting standards, and SAB 101 restatements should not be included in the GAO dataset as "accounting irregularities." I incorporated the seasoned bonds of SAB 101 firms in a robustness check and found a qualitatively similar result, so I do not report it in the final version.

[7] TRACE data add three firms (four bonds) into my seasoned bond sample. If these bonds are excluded, I still get similar results.

frequently, it is hard to get continuous daily transaction prices.[8] We merge the restatement dataset with the bond price information from both the NAIC database and TRACE. If one bond has at least one trading price in the 30 days both before and after its restatement announcement then it is included in the final sample. We follow the approach of Hand et al. (1992) in constructing the restatement event window and calculating the buy-and-hold gain or loss. The raw return for each bond is measured from the last transaction price in the period [-30, 0] to the first transaction price in the period of (0, 30). If there are multiple transactions on the same day, we use their mean for that day to calculate the holding gain or loss. For example, if a bond is traded on Days -25, -9, -5, +2, and +12, the bond raw return is calculated with the trading prices on -5 day and +2 day. CRSP provides daily trading prices for 1-year, 2-year, 5-year, 7-year, 10-year, 20-year and 30-year treasury notes. We match each corporate bond with one similar treasury note (closest in maturity) and calculate holding gain or loss of that treasury note over exactly the same time window.[9] The difference between the corporate bond holding gain or loss and the treasury note (closest maturity) holding gain or loss is the *excess bond return*. It captures the impact of the change in the cost of debt on the *seasoned bonds* for the restating firms. The treasury note benchmark helps to control the variations in interest rates due to macro-economic factors. In the multivariate regression, we use bond credit ratings before restatement announcements to control for leverage and default risk of the bond. The historical bond credit rating information comes from Standard and Poors' historical credit rating database. The final sample

[8] However, all prices are real transaction prices, not quotes by brokers.
[9] For example, if one corporate bond has two prices for its 5-year bond on -5 and +2 days. I will then pick the trading prices of 5-year treasury notes on the same -5 and +2 days and calculate the holding return on the risk-free note.

includes 137 bonds from 50 firms. The sample selection process is reported in Table1a.

A small bond sample is a common limitation in the bond literature. Notably, Dhillon and Johnson (1994) studied the impact of dividend changes on stock and bond prices. They began with an initial sample of 14,349 dividend changes and their final sample contained 131 dividend change announcements (for 131 firms), with large attrition due to the requirements of bond pricing data. Datta and Dhillion (1993) studied the bond and stock market responses to 250 unexpected earning announcements (135 firms) after starting with 1,720 unexpected earning changes. Also, Sengupta (1998) documents a negative relation between disclosure quality and the cost of debt capital with only 103 firms.

For the final sample, it is also important to check confounding events during the event windows, such as bankruptcy announcements, dividend changes, quarterly earning releases, and shareholder class action suits. First, we check the bankruptcy announcements[10] compiled by www.bankrutpcydata.com for restating firms that file for Chapter 11 bankruptcy. If one excess bond return is calculated with a transaction price after the Chapter 11 filing, then this return contains information from both the restatement announcement and the bankruptcy filing. We then checked the bond prices of those Chapter 11 firms and found that their trading prices in the event windows were all before bankruptcy filings. Therefore, the excess bond returns are likely not contaminated by bankruptcy events. Second, we also checked all the press releases for the 137 bonds (50 firms) in their event windows through *Factiva*. There

[10] For the fifty firms in the seasoned bond sample, four ultimately filed Chapter 11 bankruptcies (Enron, Worldcom, Adelphia and Mirant), but their filing dates are all after the ending dates of event windows.

are no dividend changes or announcements of such changes in the event windows for the final bond sample. Third, many firms announced their restatement decisions during quarterly conference calls. Surprises from current quarterly reports may impact bond prices, rather than the restatement news itself. Hence, we follow Wu (2002) and Palmrose et al. (2004) and classify the announcements from firms whose quarterly earnings announcements did not happen during the event window as "non-contaminated" restatement announcements, and test the "non-contaminated" sub-sample in a later section. The results from the whole sample and the "non-contaminated" sample are qualitatively similar. Finally, we identify filing dates of class action suits from *Factiva* and *Class Action Clearinghouse* (provided by Stanford University Law School) for all restating firms around their restatement announcements. We control for the litigation risk as a robustness check and again obtain similar results for the variables of interest. We will discuss this in more detail in the robustness test section.

3.2. Methodology and Measures

In this part of the study, I use independent variables at both the firm and bond levels to explain the variation in excess bond returns, and I conduct the regression analysis at the bond level. Since one firm may have multiple bonds outstanding at one time, and one restatement announcement will impact bonds of the same firm in the same direction, the assumption of independence of observations is violated at the bond level. At the same time, bond level variables are lower in hierarchy than firm-level variables (e.g., fraud dummy, amount of earning restated). Here, OLS regression is not appropriate, but hierarchical linear modeling (HLM) can handle this type of sample. HLM takes into consideration the intra-firm correlation among bonds issued by the same firm and adjusts its estimated covariance matrix. Using the maximum-likelihood paradigm in estimating coefficients, it does not require independent observations (Bryk and Raudenbush 1992; Singer 1998). The hierarchical linear modeling was developed in the 1980s and is popular among sociologists since hierarchical data are common in their fields (Butt et al. 2005; Reis and Trockel 2003; Stockard and O'Brien 2002), and is also used in management studies (Ang et al. 2002; Seibert et al. 2004; Naveh et al. 2004; Karuna 2004).

The impact of restatement announcements on seasoned bond value is tested with the following model:

$ExcessRet_i = f(ResScaled_i, YearsRes_i, Fraud_i, AgeToMatDum_i, \text{Control Variables})$ (1)

Dependent Variable

$ExcessRet_i$: the excess bond return (the buy and hold return in the event window minus the buy and hold return of a treasury note with the similar term to maturity in the *same* event window). The subscript *i* is for the *i*th bond.

Variables of Interest:

1. ResScaled: the amount of earnings restated from the historical financial statements, deflated by the total assets of the quarter before the restatement announcement. Palmrose et al. (2004) show that the amount of earnings restated is positively associated with the equity return within the event window; it is expected to be positively associated with bond returns as well. However, if there is a downward earning adjustment, then this measure is negative. The amount of earnings restated is drawn from the firm's restatement announcement, and the total asset number is from Compustat quarterly files. This firm level variable is expected to have a positive

coefficient.

2. YearsRes: the second restatement materiality measure. If one restatement only involves one quarter, then the value is 0.25. This information is provided by news releases during the restatement announcement event window. This firm-level variable is expected to be negatively associated with the excess bond return.

3. Fraud: a dummy variable following Palmrose et al. (2004). A firm is identified as fraudulent if its restatement announcement or press release admits the existence of fraudulent accounting in the past. This number will be 1 for bonds issued by firms with accounting fraud exposed by the restatement announcement date, and 0 for seasoned bonds from non-fraudulent restating firms. The coefficient is expected to be negative, since bonds of fraudulent firms are expected to have more negative excess returns than those of the non-fraudulent firms. This is a firm-level variable.

4. AgeToMatDum: a dummy variable testing for the theoretical prediction of Duffie and Lando (2001). If one bond has a maturity of less than two years between the restatement and maturity dates, then the dummy is 1. Otherwise, the dummy is 0. This bond level variable is expected to be negatively associated with the excess bond return.

Firm-level Control Variables:

Company: a dummy variable measuring restatement initiation, valuing 1 if a restatement is initiated by the company, and 0 if a restatement is prompted by other forces, like an auditor or regulators. Palmrose et al. (2004) show that restatements prompted by the firm management, to their surprise, are associated with more negative equity returns. They explain that company-initiated restatements may be prompted by external auditors or quasi-external parties like an audit committee. The announcements of such restatements send a strong negative signal to the market. Here, this variable is also controlled in the bond market regression.[11]

Bond-level Control Variables

1. LnBond: the natural log of the total face value of the bond issued (in thousands of dollars), which is used as a proxy for the liquidity of seasoned bonds (Perraudin and Taylor 2003; Houweling et al. 2002). Larger issues usually have a more active secondary market and thus higher liquidity. This variable is expected to be positively associated with bond prices. But Jorion, Wang, and Zhang (2006) show that in a large cross-sectional sample, bond issue size is positively associated with bond yield, and thus should be negatively associated with bond prices. Therefore, there is no prediction for the sign of this control variable.

2. Callable: the dummy variable for the call feature on a seasoned bond. If a bond has an embedded call option, then the dummy is 1. Otherwise, the dummy is 0.

3. Putable: the dummy variable for the put feature on a seasoned bond. If a bond has an embedded put option, then the dummy is 1. Otherwise, the dummy is 0. This variable is expected to be positively associated with excess bond returns since a put option provides protection to bondholders. A bond with a put option is expected to suffer less from the restatement announcement compared with a similar bond without the put option.

4. Enhance: the dummy variable for the credit enhancement feature[12] on a

[11] In an alternative test, I also control for the firm size in the hierarchical regression analysis and come up with similar results for variables of interest.

[12] Credit enhancement: different ways to improve the credit status of bond issues. Examples include surety bonds (an insurance policy provided by an insurance company), and third-party or parental

seasoned bond. If a bond enjoys credit enhancement facility, then it is less vulnerable to the negative impact of a restatement announcement. This dummy is expected to be positively associated with excess bond returns.

5. Redeem: a dummy indicating whether this issue is redeemable by the firm. If a bond is redeemable, then the dummy is 1. Otherwise, the dummy is 0. This dummy variable is expected to be negatively associated with excess bond returns since the buy-back option loses value when bond prices take a hit.[13]

6. Sen: if a bond is a senior bond, then the dummy is 1. Otherwise, the dummy is 0. Senior bonds are expected to suffer less from accounting restatement announcements, and the "Sen" dummy is expected to be positively associated with excess bond returns.

7. Convertible: if a bond is a convertible bond, then the dummy is 1. Otherwise, the dummy is 0. This is a bond-level variable, and there is no prediction about the sign of coefficient.

8. Ratescore: the most recent credit rating for a seasoned bond, just before the firm's restatement announcement. It has a numerical scale for each rating category: 22 for AAA , 21 for AA+, 20 for AA, 19 for AA-, 18 for A+, 17 for A, 16 for A-, 15 for BBB+, 14 for BBB, 13 for BBB-, 12 for BB+, 11 for BB, 10 for BB-, 9 for B+, 8 for B, 7 for B-, 6 for CCC+, 5 for CCC, 4 for CCC- category, 3 for CC, 2 for C and 1 for D. Controlling default risk is a standard practice in empirical bond studies (Yu 2005; Jorion et al. 2006; Campbell and Taksler 2003). Both leverage ratios and rating scores are good

guarantees.

[13] Callable bonds are usually purchased back by issuers at par values, while redeemable bonds are repurchased by issuers with premiums over the par values, usually over a pre-set schedule.

proxies for default risk and here we choose credit rating score as the control variable[14]. Its coefficient is expected to be positive.

The following regression is then estimated:

$$EXCESSRET_i = \alpha 0 + \alpha 1\ Fraud_i + \alpha 2\ YearsRes_i + \alpha 3\ ResScaled_i + \\ + \alpha 4\ AgeToMatDum_i, + \alpha 5\ Company_i + \alpha 6\ LnBond_i + \alpha 7\ Callable_i \\ + \alpha 8\ Putable_i + \alpha 9\ Enhance_i + \alpha 10\ Redeem_i + \alpha 11\ Sen_i + \alpha 12\ Convertible_i \\ + \alpha 13\ Ratescore_i + \varepsilon \qquad (2)$$

3.3. Results

The four variables of primary interest are fraud (dummy), amount of earnings restated (ResScaled), time to maturity (dummy), and years of earnings restated. We also control for bond market liquidity, bond features (e.g., call option, put option, redemption, seniority, and credit enhancement), and pre-restatement announcement bond credit rating, since bonds with high credit ratings are more removed from default risk and are usually less sensitive to restatement surprises. We first report the results of the univariate t-tests and the hierarchical linear regression, and then employ various robustness checks for the sub-samples. We conclude this section with a summary of my main findings.

3.3.1. Descriptive Statistics

<Insert Table 2 >

Table 2a and Table 2b provide the descriptive statistics for the seasoned bond sample. Since it contains both firm level variables and bond level variables, these

[14] I also try the debt-total asset ratio and get similar results for variables of interest. In addition, I test the indirect effect of both credit ratings and firm leverage (an interaction term of credit ratings or leverage with the amount of earning restated). The indirect effect of both variables is insignificant and not reported in the final model.

variables are reported in two separate panels. Table 2a shows that 22% of the firms are involved in accounting fraud. There is also a wide variation in the variable "years of earning restated", with a minimum of one quarter and a maximum of seven years. On average, the earnings are restated downward by 1.78% of the total assets (median=-0.27%). We also include firms that restated their historical earnings upward, though such cases are rare in the 50-firm (137-bond) final sample (4 firms with 5 bonds only).[15] Of the fifty restating firms in the final sample, 80 percent[16] of restatements are prompted by the companies themselves. Table 2b shows that there are large variations in two variables: age to maturity and bond issue size. Eighty percent of the bonds are short-term bonds (years to maturity less than two years), and nine and eleven percent of the final sample have embedded call option and put option, respectively.

Table 2c and Table 2d are correlation tables for the firm-level variables and the bond-level variables, respectively. Table 2c shows that the ResScaled (the amount of earnings restated) variable is highly correlated with the fraud dummy, implying that fraudulent restating firms restate their historical earnings more than non-fraudulent restating firms. It is therefore expected that in the multivariate hierarchical regression, one variable might be insignificant due to this high correlation. In Table 2d, the convertible dummy, the call dummy, and the put dummy are significantly correlated,

[15] Two firms are associated with excessive write-offs related to acquired in-process R&D, with a third one related to the overprovision of bad loan reserve and a fourth related to expense misclassification. All four restatements were pushed by the SEC. After a sensitivity check that excluded bonds from these four firms, results are similar and significant for all hypotheses related to seasoned bond sample. I follow Palmrose et al. (2004) and still keep those upward restatements for completeness.

[16] The prompter dummy, "Company", may suffer from measurement error. Though sometimes firms make restatement announcements themselves, the real pressure may come from external auditors or regulators behind the curtain. When collecting prompter information, I rely on a firm's press releases or news wires to determine the real prompter. When such information is not available, I mark the restatement as prompted by the company itself.

indicating that most bonds in the final sample with conversion features are more likely to have a call option and a put option. The EXCESSRET variable is negatively associated with the bond maturity dummy (AgeToMatDum), which is consistent with the conjecture that ceteris paribus, short-term bonds experience more negative returns when accounting restatements are announced. Below, we will perform a univariate test and then test all hypotheses in a multivariate regression.

3.3.2. Univariate Tests

<Insert Table 3>

We first test whether the excess bond return is significantly different from zero (H1). For the entire sample of 137 bonds, the mean excess return is –11.58% with a t-statistic of –6.48, significantly different from zero at the 0.001 level. Extreme observations may distort results in a small sample, so we perform a nonparametric median test, and the median (-2.05%) is also significantly different from 0 at 0.001 level.

To control for the contamination of quarterly earning announcements, we perform the same test on the non-contaminated sub-sample of 92 bonds and get similar results. Here, the mean (-15.72%) and median (-2.29%) excess bond returns are larger than those of the whole sample in magnitude. Therefore, the result is robust with regard to the noise from quarterly earning reports and H1 is supported by the univariate test.

Next, we calculate the mean excess bond returns for two sub-samples, one from restating firms with accounting fraud and the other from restating firms without accounting fraud. Both sub-samples have negative mean and median excess bond returns and they are significant at the 0.001 level. We then perform the mean comparison t-test and Wilcoxon median test between two sub-samples and find that the fraudulent sub-sample has more negative mean and median excess returns than the non-fraudulent sub-sample. Therefore H2b is supported in the univariate test.

Our final sample contains multiple bond issues from the same restating firms, and the intra-firm correlation in bond returns may artificially inflate the t-statistic. So it is important to carry out the univariate test at the firm level too. In Table 3b, we replicate the tests for the whole sample, the non-contaminated sub-sample and the fraudulent sub-sample. The results are similar at the firm level.

3.3.3. Multivariate Test

<Insert Table 4>

We regress the bond excess returns on the restatement features and bond features. The coefficient on the fraud dummy is negative and significant. Two measures of restatement materiality, the amount of earnings restated (ResScaled) and number of years (YearsRes), are both significant at the 0.001 level. The result of the amount of earnings restated is consistent with the prediction derived from the Merton model. The number of years restated is first used in Palmrose et al. (2004), who found a negative association between excess bond return and the number of years restated, implying that bond investors are more alarmed at multiple- year restatements than restatements due to small quarterly mistakes.[17] Finally, the AgeToMatDum

[17] One accounting error (intentional or unintentional) made several years in the past could result in a multiple-year restatement due to the reversal in accruals, so years restated may be a noisy proxy for restatement materiality. But the fact that one mistake can be buried for several years implies a poor accounting information system or corporate governance deficiencies. Though this measure is

coefficient is negative and significant at the 5% level, indicating that bonds with term to maturity less than two years suffer more from restatement news than other long-term bonds. This result confirms the theoretical prediction of Duffie and Lando (2001). We notice that the whole sample includes 17 convertible bonds. Convertible bonds are very different from straight bonds and as a robustness check, we delete these 17 bonds and rerun the test. The results are similar and coefficients for ResScaled, Fraud dummy,YearsRes and AgeToMatDum are all statistically significant.

To refute the argument that excess bond returns are purely a reaction to information content from quarterly earning surprises, we exclude those bonds that have a quarterly earning announcement inside the event window and rerun the hierarchical regression. The non-contaminated sub-sample has 92 seasoned bonds from 26 firms. These results are also reported in Table 4. We get similar results for the fraud dummy, amount of earnings restated, years restated, and the AgeToMatDum dummy, but the fraud dummy is only marginally significant now at the 10% level . Hence, the negative effect of accounting restatements on bond values is not driven by quarterly earning surprises.[18]

In summary, excess bond returns are more negative when there is fraud, a larger downward restatement, or a restatement over a longer time period. We also show that short-term bonds experience more negative excess returns than long-term bonds. Thus the hierarchical regression supports H2a, H2b and H2c.

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debatable, it does reflect the materiality of the restatement problem in other dimensions.

[18] Another way to deal with the quarterly earning noise is controlling for both positive and negative earning surprises in the regression model. The results are similar.

4. Analysis of the Impact of Restatements on the Cost of Newly Issued Bonds

4.1. Sample Selection

We extract information for new bond issues from the *Fixed Investment Securities Database (FISD)* for the 875 restating firms (see Table 1b). To be consistent with the seasoned bond study, our restatement sample only includes firms that announced restatements during 1997-2003. Below, we first present the descriptive statistics and correlation information, and then we regress the dependent variable RiskPrem on three groups of determinants of risk premiums: 1) accounting measures, 2) macro economic factors, and 3) bond features. The variable of interest is Offer2, a time period dummy (1 for a bond issued after a firm's restatement announcement).

We merge the 875 initial restatement announcements (the first restatement announcement for each unique firm) with data from the *Fixed Investment Securities Database (FISD).* The *FISD* database provides issue- and issuer-specific variables, such as the bond par value, credit enhancement features, and embedded options on all new U.S. corporate bond issues from 1995 to 2003. All included firms in the final sample have one new bond issue either twelve months before its restatement announcement or twelve months after its restatement announcement. The final sample contains 193 new bond issues from 79 restating firms. For each bond, we extract the accounting information from Compustat and calculate leverage ratio, interest coverage ratio, operating income profitability ratio, and the natural log value of the firm's total assets. All the accounting variables are based on the financial statements of the most recent fiscal year just before the new bond issue. These variables are important explanatory factors for the cost of new bonds (Fisher 1959; Ziebart and Reiter 1992; Sengupta 1998).

4.2. Methodology and Measures

For the test on newly issued bonds, we control for various determinants of risk premiums for new bond issues (Horrigan 1966; West 1970; Fisher 1959; Kaplan and Urwitz 1979; Sorensen 1979; Fung and Rudd 1986; Ziebart and Reiter 1992; Beaver et al. 2004). The regression model below is employed for new bonds issued by the restating firms before and after their restating announcements:

$$\begin{aligned} RiskPrem_i = {} & \alpha_0 + \alpha_1 \, lnoffering\_amt_i + \alpha_2 \, Convert_i + \alpha_4 \, Shelf_i \\ & + \alpha_5 \, Putable_i + \alpha_6 \, Logmaturity_i + \alpha_7 \, Redeemable_i \\ & + \alpha_8 \, DE_i + \alpha_9 ROS_i + \alpha_{10} InterestCov_i + \alpha_{11} \, LogAsset_i \\ & + \alpha_{12} \, Offer2 + \text{time period dummies} + \varepsilon \end{aligned} \qquad (3)$$

Dependent Variable:

RiskPrem: the risk premium required for a newly issued bond. This variable is measured in basis point, and equal to the new bond yield to maturity minus the yield on a U.S. Treasury note of comparable maturity on the issuance date. Since the yield on a treasury note is influenced by monetary policy, inflation expectation, and macro-economic factors, the RiskPrem is a better reflection of issuer risk profile and bond features than the bond yield.

Variable of Interest:

Offer2: a dummy for the issuance time period. Its value is 1 if an issue is offered after the restatement date and 0 if the new bond is offered before the restatement date, and its coefficient is expected to be positive.

Control Variables for Bond Features:

1. LnOffering_amt: the natural log of the face value of the debt initially issued. Usually a large bond issue can enjoy a lower risk premium due to scale, but Jorion, Wang, and Zhang (2006) show that bond issue size is positively associated with bond yields in a large cross-sectional sample. Therefore, there is no prediction for the sign of this control variable.

2. Convert: a dummy indicating whether a bond is issued with a conversion option. Mayers (1998) shows that convertible bonds help lower a firm's financing cost, and Billingsley and Smith (1996) find that a lower interest rate is one major incentive for firms to use convertible bonds for debt financing. It is expected that convertible bonds will incur less financing costs than straight bonds issued by the same firm. Therefore, the coefficient of this dummy is expected to be negative.

3. Shelf: a dummy indicating whether a bond is issued as a shelf registration. American corporations are required to file with the SEC when they issue new stocks or bonds. To cut down paperwork and delay, SEC Rule 415 allows issuers to pre-register a certain amount of securities for up to two years. Issuers then have the flexibility of taking bonds off the "shelf" and offering them to the public when favorably timed with lower financing costs. Therefore, it is expected that a bond issued under shelf registration will enjoy a lower risk premium than another similar bond issued without the Rule 415 flexibility.

4. Putable: the dummy variable for the put feature on a new issue. If one bond has an embedded put option, then the dummy is 1. Otherwise, the dummy is 0.

Put options give bondholders the right to sell back bonds to issuers at pre-set prices. To enjoy this benefit, bond investors are expected to have lower risk premiums. So, this bond-level variable should be negatively associated with risk premiums on new issues.

5. Logmaturity: the natural log of maturity (in years). Long-term new issues are perceived to be more risky than short-term issues, so the log of maturity is expected to be positively associated with the risk premium.

Control Variable of Firm Performance

1. DE: total debt divided by total assets, based on the most recent annual report numbers before the new bond issue. This is a measure of leverage used in Blume et al. (1998) and is expected to be positively associated with risk premiums.

2. ROS: profitability ratio, a ratio of operating income to sales revenue for the most recent annual income statement before a new bond issue. This variable is expected to be negatively associated with risk premiums.

3. LogAsset: the natural log of the total assets for the restating firm from the most recent annual report before the new bond issue. This variable controls for firm size. New bonds issued by large firms are perceived to be less risky than those from small firms, so it is expected to be negatively associated with the risk premium.

4. InterestCov: interest coverage ratio (operating income divided by interest expense) from the most recent annual report before a new bond issue. According to previous bond studies, it is expected to be negatively associated with the risk premium.

Control of the Macro Economic Factors

It is also important to control the shift in macroeconomic environment, especially for boom or bust years. Like Shi (2003), we introduce year dummies for all bonds issued from 1996 (for the earliest restating firms in 1997) to 2004 (the post-announcement issues of firms that restated in 2003). Alternatively, to control for the shift in macroeconomic environment, we introduce the "recession" dummy for new bonds issued in 2001 and 2002 in the U.S. During these two years, America was in a recession, and a tighter financial market may push up bond financing costs for firms. With both methods, we get similar results for the Offer2 time period dummy.

4.3. Empirical Results

4.3.1. Descriptive statistics and correlation table

<Insert Table 5>

Table 5 contains the descriptive statistics for the new bond sample. Fifty-two percent of the sample (100 bonds) is issued after the restatement announcements, and 56% of the bonds are issued under the shelf registration with the SEC. There are large variations in the four accounting measures: debt-to-total-asset (DE), return on sales (ROS), interest coverage (InterestCov), and the natural log of total assets (LogAssets).

<Insert Table 6>

In Table 6, the callable dummy is almost perfectly correlated with the redeemable dummy, implying a multi-collenearity issue for future multivariate regressions. Therefore, in all future regressions, we drop the "callable" dummy and keep only the "redeemable" dummy. The correlation table shows that the bond rating variable is highly correlated with most bond features, such as Lnoffering_Amt, shelf dummy, the "redeemable" dummy and four accounting variables, especially the firm size variable. This is not surprising since S&P looks at accounting measures and bond features to determine credit ratings (S&P, 2003), and these measures play a major role in explaining variations in bond credit ratings (Kaplan and Urwitz, 1979; Fung and Rudd, 1986; Ziebart and Reiter, 1992; Beaver et al. 2004). However, the inclusion of ratings in the regression might distort the coefficients for these variables of interest due to the high correlation. We will revisit this issue in the robustness check section.

Here, the dummy variable Offer2 captures the additional premiums that the bond investors demand for the newly issued bonds after restatement announcements and compensates for additional uncertainty. We are interested in whether the Offer2 dummy is positively significant in the multivariate regression after controlling for various factors, which have been documented as the main determinants of the new issue risk premium.

4.3.2. Multivariate regressions and robustness check

<Insert Table 7>

First, we regress the risk premiums on the accounting variables, year dummies from 1996 to 2004, and bond features. Most control variables have the expected signs for their coefficients. Operating profit margin (ROS) is significantly and negatively associated with the risk premium, as expected. The coefficient for the log-transformed total asset is negative and significant. Also, size is a usually proxy of default risk, and the result here is consistent with a previous study (Shi, 2003) that implies that large firms usually enjoy a better credit term and lower borrowing rates in the bond market. The coefficient on Offer2 dummy is positive and significant, indicating that, on average, bonds issued after announcements by restating firms pay 65.97 more in basis points to attract investors[19].

Second, we include the bond rating variable in the regression model. The rating scores (Ratescore) are negatively associated with risk premiums and are significant at the 0.001 level. It is natural that bonds with high ratings enjoy lower risk premiums, but interestingly, "Ratescore" competes against the shelf dummy, the redeemable dummy and all accounting variables, and distorts the coefficients for these control variables (with signs opposite to results from previous regression and normal expectation). The VIF (variance inflation factors) of LogAsset variable jumps to 4.49 when "Ratescore" is introduced[20]. The VIF score for "Ratescore" is 3.85, indicating the existence of multi-collenarity when "Ratescore" is introduced. Therefore, "Ratescore" is not included in the final regression due to the serious multi-collenearity issue between this variable and other control variables.

Alternatively, we attempt to control for the macro-economic changes with one dummy "recession" rather than the annual year dummies. If one bond was issued in 2001 and 2002 (the most recent recession period in the U.S.), the dummy value is set to 1. For bonds issued in other years, the dummy value is 0. The coefficient of this dummy is positive (92.52) and significant at 0.001 level, indicating that there is a difference in risk premium over time due to changes in the macroeconomic environment. Again, the Offer2 dummy has a positive coefficient (62.03), and the result is significant at the 0.01 level. Therefore, our result is robust with regard to alternative control over

[19] There are 37 convertible bonds in the new issue sample. As a robustness check, I delete them from the sample and rerun the regression, the coefficient for Offer2 is still positive and significant at 0.01 level. The coefficient is 69.44, close to the result from the whole sample.
[20] Similar pattern of VIF rise for the shelf dummy, the redeemable dummy and other three accounting variables.

macroeconomic factors. The result is not tabulated here.

Overall, part two shows that restatement announcements bring additional uncertainty to bond investors and impact their confidence in future cash flows. In response, investors demand higher premiums for post-announcement issues, even if these new bonds are equivalent to bonds issued before restatement announcements in terms of bond features, firm financial positions, and credit ratings. Our findings complement the results of Hribar and Jenkins (2004) concerning the negative impact of accounting restatement announcements on the equity cost of capital.

5. Robustness Checks for Seasoned Bonds

5.1. Quarterly Earning Surprises

Some firms announced their restatement decisions during quarterly conference calls. Therefore, bond price changes may reflect the impact of quarterly financial results, rather than restatement announcements. Hence, we note non-contaminated restatement announcements and test both the whole sample and the "non-contaminated" sub-sample as in Palmrose et al. (2004) and Wu (2002). The results from the non-contaminated sub-sample are qualitatively similar to those of the whole sample, as seen in the right hand section of table 4.

Another way to perform the robustness check on the confounding effect of quarterly earning announcements is to control for earning surprises in the regression analysis. The results are qualitatively similar, and both negative and positive earning surprise variables have the expected signs but are not statistically significant. Therefore, the results are not reported here.

5.2. Shorter Window

<Insert Table 8>

The long event window inevitably invites noise and the possibility of confounding events. Here, we add an additional requirement in data collection: for a bond with at least one trading price in both [-30, 0) and (0, 30], the time-span between the two transaction prices should be no more than 30 trading days.[21] The new restriction reduces the whole sample size to 92 bonds (33 firms) and the non-contaminated sub-sample size to 81 bonds (22 firms). We perform the same regressions on both the whole sample and the non-contaminated sub-sample, and still get significant results for the three key variables: years restated, the amount of earning restated, and the bond maturity dummy. The fraud dummy is no longer significant, partially due to the small sample size and thus weaker power of the tests.

Therefore, it is concluded that our previous results for seasoned bonds are largely robust with regard to the event window choice.

5.3. Litigation Risk

Corporations in the U.S. often face various litigations. Some are related to product defects (Shavell and Polinsky 2005;Viscusi and Hersch 1990), while others are related to the financial market: misrepresentations in financial statements, and false or misleading forward-looking statements (Grundfest and Perino 1997; Grundfest and Griffin 2004; Palmrose and Scholz 2004). Litigation is costly to corporations and eventually to shareholders and bondholders, since it diverts management's time and

[21] I also test the 20-day restriction. The results for fraud, years restated, restated earnings, and the bond maturity dummy are still significant. The results are thus robust with regard to these shorter event window lengths.

attention, damages firm reputation, and siphons off resources for legal battles. In extreme cases, it can push a firm into bankruptcy.[22] Shareholder values are expected to suffer around these events, as documented in Griffin and Grundfest (2004), Prince and Rubin (2002), and Beck and Bhagat (1999).[23]

A shareholder class action event or product defect litigation can be a comfounding event to our bond market event study, since it can happen before the restatement announcement and fall in our event window. Consequently, the negative market reaction documented in section three can be driven by anticipated future litigation loss as well as the restatement announcement. However, if suits are filed after the restatement announcement and fall outside our event window, then the event window is not contaminated by the litigation event. Previous studies (Francis et al. 2004; Wu, 2002) did not explore this technical issue and our work supplements existing literature.

We searched both the *Class Action Clearinghouse* (provided by the Stanford University Law School) and *Factiva* for news about shareholder class action suits and product defect suits. We did not find announcements of product liability litigations within our event windows but did find many shareholder class action filings. Frequently, one restating firm is sued by multiple law firms, and the cases are filed over several different days. We have selected the earliest filing date as the litigation

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[22] One extreme example of the litigation risk was Texaco. The company signed an acquisition contract with Getty Oil after it already entered into an unsigned acquisition contract with Pennzoil. Pennzoil sued Texaco and won a $10.53 billion verdict, Texaco was pushed into Chapter 11 bankruptcy.

[23] In contrast to common shareholders, corporate bondholders are usually senior creditors (in my seasoned bond sample, 91% bonds are senior bonds), and they have priority over unsecured claims, such as damages awarded by courts to shareholders. In the case of liquidation, senior creditors are satisfied first, followed by junior creditors, and, lastly, common shareholders (Altman, 1993). Therefore, the threat of litigation loss should have a more pronounced effect on share prices than on bond prices around restatement announcements. However, it still may be important to control for litigation threats from both product liability litigations and shareholder class action suits in my bond study event windows.

event date. If one restating firm is sued in the event window, the litigation dummy for its bond is set to 1. Otherwise, the dummy is 0. Of course, the bondholders might also file class action suits against firms, but the bondholder class action suits are scarce in our sample and none are in the event windows. Thus we control for the shareholder litigation factor and rerun the regression for the seasoned bond sample. The results are similar to the previous ones: fraud, years restated, restated earnings, and AgeToMatDum are significant with the expected signs. Therefore, these results are not tabulated.

In sum, litigation risk is expected to explain part of the negative stock return around restatement announcements, but it has no significant impact on seasoned bond prices. Our results are robust with regard to the litigation threat factor.

5.4. Alternative Bond Test Method One: One Representative Bond for Each Firm.

Prior bond studies deal with multiple bonds in three different ways: 1) Bonds are separately observed. This method is used in our seasoned bond study. It allows for more information (e.g., various bond features for multiple bonds), but also violates the assumption of independence and makes OLS analysis inappropriate. Here, for the seasoned bond study, we successfully resolved this issue with Hierarchical Linear Modeling. 2) One bond for each firm in the sample is taken to be representative, as seen in Dhillon and Johnson (1994), Handjinicolaou and Kalay (1984) and Hite and Owers (1983), etc. This method avoids the independence issue but understates value changes around events.[24] Here, we will use this method for a robustness check. 3) Lastly, each firm can be treated as an independent observation with a separate bond portfolio return.

[24] Some firms have multiple bonds outstanding and traded in the market. If a negative event hits one firm, and all of its bonds decline in value, the representative bond method will understate the scale of absolute value loss for bondholders by including only one bond in the sample.

This method is free from cross-correlation problems and better reflects the change in value of the firm associated with a corporate event. A disadvantage is that the aggregation process loses detailed information about various bond features. We will test this method later.

As to the choice of one representative bond for each firm, we follow Handjinicolaou and Kalay (1984) and Dhillon and Johnson (1994), selecting the most frequently traded bonds for each firm. All trading information comes from the NAIC database. The trading volume for each bond is based on the aggregate face value of bonds traded for two months before and after restatement announcements (for the time window of [-60, 60]. For each firm, the most actively traded bond is placed in the final sample for an OLS regression, narrowing the sample size to 50 bonds. Results are largely consistent with those of the full sample, with the exception of the maturity dummy, whose coefficient is no longer statistically significant.

5.5. Alternative Bond Test Method Three: Firm-level Portfolio Abnormal Return

There are two ways to form a firm-level bond portfolio: the equal-weighted approach and the value-weighted approach. In Table 3b, we have performed the univariate test on firm-level, equal-weighted portfolios, and all the following tests will focus on the value-weighted approach.

Since we form firm-level portfolios, all bond feature variables are dropped and the regression now tests only firm-level variables (the amount of earnings restated, years restated, and the fraud dummy). Again, two variables, the amount of earnings restated and the number of years of restatement, are significant at 0.01 level with expected signs. So H2a is again supported under the third bond test method.

6. Conclusions

Anecdotal evidence indicates that investors of seasoned bonds experience losses from accounting restatements, but there is little attention to their losses from either regulatory agencies or the legislature. There has not been a systematic study evaluating the underlying factors of bond market reactions or the post-announcement effect on the cost of debt capital for new issues. This paper fills this void in the accounting literature and will be of interest to bondholders, academicians, and regulatory agencies alike.

We first examine the excess returns of 137 *seasoned* bonds (50 firms) over the event windows and find, on average, an excess return of –11.58%. Based on the theoretical work of bond valuation and equity research, we conjecture that bonds for firms associated with fraud, larger restated earning numbers, and longer years of restatements should have more negative excess returns. We also explore the relation between bond features and excess bond returns, especially relating to the maturity of seasoned bonds. Overall, the evidence supports our hypotheses on bond returns, years restated, the amount of earnings restated, the fraud dummy, and bond maturity. Alternative bond tests lend strong support to the hypotheses related to fraud and amount of earnings restated, but are insignificant for other variables of interest. Therefore, this sample construction does not drive the results for the fraud dummy and the amount of earnings restated variables.

We then perform several checks to verify the robustness of the results. First, we scoured the news to ensure that our event window does not include bankruptcies or dividend changes, ensuring that the results are robust with regard to these two competing events. Second, we exclude bonds with quarterly earning announcements in their event windows and test the non-contaminated sub-sample. The results are similar, showing that our results are also not driven by earning surprises from quarterly reports. Third, we perform robustness checks by shortening the event window, again with similar results. Lastly, we incorporate the shareholder litigation factor in our model and find the results to be robust.

Finally, we show that after restatement announcements, investors demand a premium for the higher risk associated with the information uncertainty introduced by the restatements, even after controlling for macroeconomic factors, firm-level factors, and bond features. Overall, the results from this exploratory study on the cost of new bonds supplement the previous studies on accounting quality and equity cost of capital (Francis et al. 2005; Hribar and Jenkins 2004).

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Table 1a. Sample Selection for Seasoned Bonds

		Restatement Announcements	Unique Firms	Bonds
GAO Source (1/1/1997-6/30/2002)		919		
Hand-collection (7/1/2002-12/31/2003)		280		
Initial Sample		1299		
Reasons for Deletions				
	Missing in Compustat	(194)		
	SAB 101 Implementation	(55)		
Restatements		1050	875	
	Firms with no bond tradings in the [-30, 30] window		(825)	
Final Sample			50	137

Table 1b. Sample Selection for Newly Issued Bonds (New Issues Through 2003)

		Restatement Announcements	Unique Firms	Unique Bonds
GAO Source (1/1/1997—6/30/2002)		919		
Hand-collection (7/1/2002-12/31/2003)		380		
Initial Sample		1299		
Reasons for Deletions				
	Missing in Compustat	(194)		
	SAB 101 Implementation	(55)		
Restatements		1050	875	
	Firms without one new bond issue 12 months before or after the restatement announcement		(796)	
Final Sample			79	193

Table 2a. Descriptive Statistics for Seasoned Bonds, Firm-Level Variables

Variables	Number	Mean	Standard Deviation	Median	Minimum	Maximum
Fraud	50	0.22	0.42	0	0	1.00
YearsRes	50	1.58	1.46	1.00	0.25	7.00
ResScaled	50	-1.78%	0.05	-0.27%	-27.4%	0.58%
Company	50	0.80	0.40	1.00	0	1.00

Table 2b. Descriptive Statistics for Seasoned Bonds, Bond-Level Variables

Variables	Number	Mean	Standard Deviation	Median	Minimum	Maximum
EXCESSRET (%)	137	-11.58	20.92	-2.05	-82.63	5.00
Age	137	2.93	3.13	1.74	0.08	17.65
AgeToMat	137	10.76	11.03	7.63	0.89	94.86
AgeToMatDum	137	0.08	0.27	0.00	0.00	1.00
Offering_amt (in thousands)	137	657,388	774,349	350,000	17,654	4,600,000
Lnbond	137	12.93	0.97	12.77	9.78	15.34
Callable	137	0.09	0.28	0.00	0.00	1.00
Putable	137	0.11	0.31	0.00	0.00	1.00
Enhance	137	0.03	0.17	0.00	0.00	1.00
Redeem	137	0.58	0.49	1.00	0.00	1.00
Sen	137	0.91	0.28	1.00	0.00	1.00
Convertible	137	0.12	0.33	0.00	0.00	1.00
Ratescore	137	14.66	3.64	15.00	6.00	22.00
Distance	137	18.04	14.09	17.00	2.00	56.00

Variable Definitions

1. ExcessRet= the buy and hold return in the event window minus the buy and hold return of a treasury note with similar term to maturity in the same event window.
2. Fraud= 1 if the bond is issued by a firm with accounting fraud exposed in the restatement announcement event window. This dummy variable will be 0 for seasoned bonds from non-fraudulent firms.
3. YearsRes= number of years restated. If there is only one quarter to be restated, then it is 0.25.
4. ResScaled= total amount of earnings restated from the historical reports, deflated by the total asset of the most recent quarter just before the restatement announcement.
5. LnAge= natural log of the years between the original issue date and the restatement announcement date. It is a proxy of the bond liquidity in the secondary bond market.
6. Lnbond= natural log of the par value of the bond.
7. Age= number of years between the original issue date and the restatement announcement date.
8. Company= dummy for the prompter of the restatement. If the restatement originates from the company itself, then the dummy is 1. For others, the dummy is 0.
9. AgeToMat= number of years between the restatement date and the maturity date of the seasoned bonds.
10. AgeToMatDum= a dummy variable testing the theoretical prediction of Duffie and Lando (2001). If one bond has an age of less than two years between the restatement date and maturity date, then the dummy is 1. For long-maturity bonds, the dummy is 0.
11. Offering_amt= total par value of the bond issue, in thousands of dollars.
12. Callable= dummy variable for the call feature on the seasoned bond. If one bond has an embedded call option, then the dummy is 1. Otherwise, the dummy is 0.
13. Putable= dummy variable for the put feature on the seasoned bond. If one bond has an embedded put option, then the dummy is 1. Otherwise, the dummy is 0.
14. Enhance= dummy variable for the credit enhancement feature of the seasoned bond. If one bond enjoys credit enhancement facilities, then it provides higher assurance for bondholders. This dummy is expected to be positively associated with excess bond return.
15. Redeem= dummy variable indicating whether this issue is redeemable by the firm.
16. Convertible= dummy variable for the conversion feature on the seasoned bond. If one bond has an embedded conversion option, then the dummy is 1. Otherwise, the dummy is 0.
17. Ratescore= converted numerical rating scales, with 22 for the highest AAA rating and 1 for the lowest D rating. The character ratings are provided by S&P.
18. Distance= number of trading days between the last trading price before the restatement announcement and the first trading price after the restatement announcement.

Table 2c. Correlation Matrix for the Seasoned Bond Sample (Firm-Level Variables, 50 Firms).

	Fraud	YearsRes	ResScaled	Company
Fraud	1.000	0.164	-0.416**	0.145
YearsRes		1.000	-0.031	-0.224
ResScaled			1.000	-0.169
Company				1.000

***--significant at the 0.001 level
** --significant at the 0.01 level
* --significant at the 0.05 level

Table 2d. Correlation Matrix for the Seasoned Bond Sample (Bond-Level Variables, 137 Bonds)

	ExcessRet	LnAge	AgetoMatDum	LnBond	Callable	Putable	Enhance	Redeem	Sen	Convertible
LnAge	-0.113									
AgetoMatDum	-0.261*	0.139								
LnBond	-0.143	-0.330***	-0.092							
Callable	-0.041	-0.186	-0.092	0.081						
Putable	-0.005	-0.138*	-0.104	0.137	0.801***					
Enhance	0.097	-0.074	-0.051	-0.027	-0.054	-0.061				
Redeem	0.090	-0.359***	-0.132	0.317**	0.209*	0.201*	0.146			
Sen	-0.093	-0.271**	0.092	0.350**	0.004	0.109	0.054	0.367***		
Convertible	0.059	-0.147	-0.030	0.178	0.588***	0.577***	-0.065	0.317**	0.117	
Ratescore	0.339***	0.205	-0.010	-0.185**	0.100	0.032	-0.079	0.160	-0.455***	-0.026

***--significant at the 0.001 level
** --significant at the 0.01 level
* --significant at the 0.05 level

Table 3a. Univariate Test on Bond Market Reaction to Restatement Announcement, Bond-Level

	Whole Sample(%)	Non-Fraud Sub-sample(%)	Fraud Sub-sample(%)	Non-contaminated Subsample(%)
Event Window	[-30,30]	[-30,30]	[-30,30]	[-30,30]
Num of Bonds	137	89	48	92
Mean	-11.58	-2.76	-27.93	-15.72
Standard deviation	20.92	5.53	28.08	24.34
Median	-2.05	-1.24	-15.27	-2.29
Wilcoxon Median Test Null:median ExcessRet=0	-9.71***	-5.95***	-8.27***	-8.71***
Wilcoxon Test Null:median ExcessRet (fraud) = median ExcesssRet(non-fraud)		-6.42***		
Null:mean ExcessRet=0, two-tailed test (t-value)	-6.48***	-4.70***	-6.89***	-6.20***
Null: mean ExcessRet (fraud)= mean ExcessRet (non-fraud)		-8.19***		

***--significant at the 0.001 level
** --significant at the 0.01 level
* --significant at the 0.05 level

Table 3b. Univariate Test on Bond Market Reaction to Restatement Announcement, Firm-Level

	Whole Sample(%)	Non-Fraud Sub-sample(%)	Fraud Sub-sample(%)	Non-contaminated Subsample(%)
Event Window	[-30,30]	[-30,30]	[-30,30]	[-30,30]
Num of Firms	50	39	11	26
Mean	-7.09	-3.10	-21.20	-11.71
Standard deviation	13.46	5.19	22.50	17.24
Median	-2.31	-1.86	-11.16	-3.68
Wilcoxon Median Test Null:median ExcessRet=0	–5.52***	-3.95***	-4.21***	-2.41***
Wilcoxon Test Null:median ExcessRet (fraud) = median ExcesssRet(non-fraud)		-2.47*		
(t-statistic) Null: mean ExcessRet=0, two-tailed test (t-value)	(-3.72)***	(-3.76)***	(-3.13)**	(-3.46)***
Null: mean ExcessRet (fraud)= mean ExcessRet (non-fraud)		-4.72*		

Table 4. Hierarchical Regression for Seasoned Bonds

Model: $ExcessRet_i = \alpha_0 + \alpha_1 Fraud_i + \alpha_2 YearsRes + \alpha_3 ResScaled_i$
$+ \alpha_4 AgeToMatDum_{i,} + \alpha_5 Company_i + \alpha_6 LnBond_i$
$+ \alpha_7 Callable_i + \alpha_8 Putable_i + \alpha_9 Enhance_i + \alpha_{10} Redeem_I$
$+ \alpha_{11} Sen_I + \alpha_{12} RatescoreV2 + \alpha_{13} Convertible + \varepsilon$

			Whole Sample(137 bonds, 50 firms)			Non-contaminated Sample(92 bonds, 26 firms)		
Variables	Coefficients	Predicted	Coefficients	T-value	P-value	Coefficients	T-value	P-value
Intercept	α0	?	-0.091	-0.48	0.633	-0.041	-0.15	0.880
Fraud (H2b)	α1	-	-0.075	-2.12	0.039	-0.106	-1.78	0.089
YearsRes (H2a)	α2	-	-0.043	-4.14	0.000	-0.051	-2.96	0.007
ResScaled (H2a)	α3	+	1.728	7.46	0.000	1.718	5.70	0.000
AgeToMatDum (H2c)	α4	-	-0.108	-2.45	0.016	-0.178	-2.84	0.006
Company	α5	-	-0.105	-3.07	0.003	-0.167	-2.85	0.009
LnBond	α6	?	0.020	1.37	0.175	0.021	1.08	0.287
Callable	α7	-	-0.064	-0.88	0.381	-0.103	-1.14	0.258
Putable	α8	+	0.043	0.68	0.501	-0.018	-0.23	0.816
Enhance	α9	+	0.054	1.12	0.267	0.049	0.56	0.576
Redeem	α10	-	0.080	0.17	0.863	0.011	0.28	0.780
Sen	α11	+	-0.008	-0.15	0.881	0.001	0.01	0.994
Ratescore	α12	+	-0.002	-0.53	0.597	-0.005	-0.91	0.368
Convertible	α13	?	0.045	0.98	0.331	0.140	1.52	0.134

Notes: a. Definitions of the variables are in Table 2. b. Hierarchical linear model can handle variables measured at more than one level of a hierarchy (Bryk and Raudenbush, 1992; Singer, 1998) and adjust the statistics with intra-firm correlations among bonds.

Table 5. Descriptive Statistics, Newly Issued Bonds

Variable	N	Mean	Median	Std Dev	Minimum	Maximum
RiskPrem	193	192.18	120.00	193.89	0.00	879.99
Ratescore	137	13.80	14.00	3.40	6.00	20.00
Lnoffering_amt	193	12.70	12.69	0.84	10.31	15.35
Convert	193	0.19	0.00	0.39	0.00	1.00
Callable	193	0.68	1.00	0.47	0.00	1.00
Shelf	193	0.56	1.00	0.50	0.00	1.00
Putable	193	0.09	0.00	0.29	0.00	1.00
Logmaturity	193	2.07	2.28	0.61	0.33	3.40
Redeemable	193	0.68	1.00	0.47	0.00	1.00
DE	193	0.71	0.71	0.19	0.36	1.42
ROS	193	-0.04	0.02	0.70	-8.69	0.41
InterestCov	193	6.27	3.91	11.95	0.00	100.00
LOGasset	193	8.95	9.33	1.83	4.28	13.09
Offer2	193	0.52	1.00	0.50	0.00	1.00
Recession	193	0.45	0.00	0.50	0.00	1.00

Definitions of Variables

1. RiskPrem = new bond yield to maturity minus the yield on a U.S. Treasury note of comparable maturity on the issuance date, measured in basis points.
2. Ratescore = converted numerical rating scales, with 22 for the highest AAA rating and 1 for the lowest D rating. The character ratings are provided by S&P.
3. Lnoffering_amt = the natural log of the par value of the debt initially issued (in millions of dollars).
4. Convert = dummy variable indicating whether one bond is convertible into stock or not.
5. Callable = dummy variable indicating whether one bond is callable by the firm or not.
6. Shelf = dummy indicating whether one bond is issued under a shelf registration.
7. Putable = dummy variable for the put feature on a new issue. If one bond has an embedded put option, then the dummy is 1. Otherwise,

the dummy is 0.

8. Logmaturity = the log of maturity (in years).
9. Redeemable = dummy variable indicating whether one bond can be redeemed by the firm in the future.
10. DE = total debt divided by total assets based on the annual report numbers just before the new bond issue, a measure of leverage. Here, the denominator is not equal to the total shareholders' equity, since it can be negative for firms with poor financial performance and distort the leverage ratio.
11. ROS = profitability ratio, a ratio between operating income and sales for the most recent annual income statement before the new bond issue.
12. InterestCov = interest coverage ratio (operating income /interest expense) from the most recent annual report before a new bond issue.
13. LOGasset = the natural log of the total assets for the restating firm from the most recent annual report before the new bond issue.
14. Offer2 = a dummy variable for the issuance time period. It will be 1 if the issue is offered after the restatement date and 0 if the bond is offered before the restatement date.
15. Recession = a dummy variable controlling for the time period effect of the recent recession period of 2001 and 2002. If one bond is issued in 2001 or 2002, the value of the dummy is 1.

Table 6. Correlation Matrix for Variables of Newly Issued Bonds

	RiskPrem	Ratescore	Lnoffering _amt	Convertible	Callable	Shelf	Put	LogMaturity	Redeemable	DE	ROS	InterestCov	LOGasset
Ratescore	-0.60***												
lnoffering_amt	-0.19**	0.46***											
Convert	-0.25***	-0.03	0.01										
Callable	0.15*	-0.39***	-0.19**	0.07									
Shelf	-0.30***	0.55***	0.28***	-0.12	-0.18**								
Put	-0.23***	0.16	0.30***	0.44***	0.14*	-0.01							
Logmaturity	-0.14	0.03	-0.03	0.08	0.07	0.15*	0.18*						
Redeemable	0.15	-0.37***	-0.17*	0.10	0.99***	-0.17*	0.14*	0.07					
DE	0.13	-0.23**	-0.14*	0.04	-0.13	-0.19**	-0.05	-0.11	-0.15*				
ROS	-0.18**	0.26*	-0.02	0.01	0.05	0.16*	0.03	-0.05	-0.05	0.23**			
Interestcov	0.14 *	0.19*	0.03	0.00	0.04	0.05	0.03	0.07	0.08	-0.25***	0.08		
LOGasset	-0.35***	0.70***	0.60***	-0.21*	-0.42***	0.38***	0.12	-0.09	-0.41***	-0.01	0.15	-0.04	
Offer2	0.06	-0.12	0.00	0.01	-0.02	0.18**	-0.05	-0.11	-0.01	-0.01	0.11	0.00	0.03

*** --significant at the 0.001 level
** --significant at the 0.01 level
* --significant at the 0.05 level

Table 7. Results for Newly Issued Bonds

Regression of the Risk Premiums of Newly Issued Bonds for Accounting Ratios and Bond Features.
(193 Newly Issued Bonds for 79 restating firms, One Year Window).

Model: RiskPrem i = α_0 + α_1 Lnoffering_amti + α_2 convert $_I$ + α_4 Shelf i
+ α_5Putablei + α_6Logmaturity i + α_7Redeemable $_I$ +α_8DE i + α_9ROSi
+ α_{10}nterestCovi+ α_{11}LogAsset i + α_{12} Offer2 + time period dummies + ε

Variables	Coefficients	Predicted Sign	Coefficients	T-value	P-value
Intercept	α0	?	167.21	0.55	0.58
Lnoffering_amt	α1	?	23.19	1.25	0.21
Convert	α2	-	-169.01	-4.75	0.00
Shelf	α4	-	-99.12	-3.50	0.00
Putable	α5	-	-25.56	-0.50	0.62
Logmaturity	α6	+	-23.52	-1.18	0.24
Redeemable	α7	+	28.31	0.97	0.33
DE	α8	+	140.45	1.93	0.05
ROS	α9	-	-39.21	-2.10	0.04
InterestCov	α10	-	-1.33	-1.30	0.20
LogAsset	α11	-	-35.72	-3.68	0.00
Offer2	α12	+	65.97	2.60	0.01
Adj. R^2			0.41		

Note: definitions of variables are in Table 5. Year dummies are also included in the model, but the result is not reported here.

Table 8. Robustness Check for Seasoned Bonds When the Time Length between Two Trading Days is Limited to 30 Days

Model: $ExcessRet_i = \alpha_0 + \alpha_1 Fraud_i + \alpha_2 YearsRes + \alpha_3 ResScaled_i$
$+\alpha_4 AgeToMatDum_{i,} + \alpha_5 Company_i + \alpha_6 LnBond_i$
$+ \alpha_7 Callable_i + \alpha_8 Putable_i + \alpha_9 Enhance_i + \alpha_{10} Redeem_I$
$+\alpha_{11} Sen_I + \alpha_{12} Ratescore + \alpha_{13} Convertible + \varepsilon$

			Whole Sample(92 bonds, 33 firms)			Non-contaminated Sample(81 bonds, 22 firms)		
Variables	Coefficients	Predicted	Coefficients	T-value	P-value	Coefficients	T-value	P-value
Intercept	α0	?	-0.097	-0.49	0.629	-0.060	-0.21	0.835
Fraud (H2b)	α1	-	-0.051	-1.29	0.208	-0.058	-0.90	0.382
YearsRes (H2a)	α2	-	-0.048	-4.13	0.000	-0.070	-3.80	0.001
ResScaled (H2a)	α3	+	2.040	8.92	0.000	1.907	6.01	0.000
AgeToMatDum (H2c)	α4	-	-0.151	-2.09	0.043	-0.171	-2.30	0.026
Company	α5	-	-0.096	-2.00	0.055	-0.137	-2.00	0.059
LnBond	α6	+	0.022	1.55	0.126	0.027	1.37	0.178
Callable	α7	-	-0.031	-0.41	0.686	-0.057	-0.59	0.558
Putable	α8	+	0.027	0.41	0.680	-0.001	-0.01	0.996
Enhance	α9	+	0.082	1.12	0.274	0.063	0.65	0.526
Redeem	α10	-	-0.036	-1.13	0.263	0.012	0.28	0.778
Sen	α11	+	0.038	0.75	0.460	0.032	0.46	0.648
Ratescore	α12	+	-0.004	-0.73	0.466	-0.005	-0.89	0.377
Convertible	α13	?	0.036	0.78	0.439	0.099	0.94	-0.353

Note: the definitions of variables are in Table 2.