THREE ESSAYS ON BOND RETURNS AND THE COST OF DEBT

by

Sailu Li

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Approved by:

_____
Dr. Tao-Hsien Dolly King

_____
Dr. Steven Clark

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Dr. I-Hsuan Ethan Chiang

_____
Dr. Keejae Hong

ABSTRACT

SAILU LI. Three essays on bond returns and the cost of debt. (Under the direction of DR. TAO-HSIEN DOLLY KING)

The three essays in this dissertation are focused on the same general research topic: returns to bondholders and the cost of debt. Each of the three essays should be treated as a stand-alone paper. The first essay is on the bond returns to debtholders. In this paper, I investigate whether conglomerate and standalone firms provides different returns to their bondholders based on a sample of investment grade bonds from 1994-2015. I find that bonds issued by standalone firms have a significantly lower return than bonds issued by conglomerates. The second and the third essay are interdisciplinary research of finance and accounting, with the second one on the effect of corporate earnings restatement on the cost of debt, while the third one on the effect of managerial voluntary disclosure on the cost of debt. The second paper is a first study of the effect of operating cash flow restatements on a firm's cost of debt capital. My results indicate that firms with understated operating cash flows experience a reduced cost of debt capital after the announcements, supporting the notion that the restatement signals a firm's favorable performance. On the other hand, the change in cost of debt for firms with overstated operating cash flow is generally insignificant. In the third paper, I investigate if and how managerial voluntary disclosure affects a firm's cost of debt. My results indicate that managerial earnings forecast reduces information asymmetry, thus reduces the cost of debt. Moreover, the effect is asymmetric as investors respond to the additional information incorporated in the voluntary forecasts: positive surprises released in managerial earnings forecast reduce a firm's cost of debt while negative surprises increase a firm's cost of debt.

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CHAPTER 1: INTRODUCTION

1.1. Introduction

In general, companies raise capital in two main forms: debt and equity. According to the Securities Industry and Financial Markets Association (SIFMA), U.S. corporate bond issuance in year 2015 is $1,493.7 billion, which has increased by around 3.45% compared to year 2014. Within the total new issuance, $1,233 billion corporate bonds are issued as investment grade bonds and $260.7 billion are issued as high yield bonds. In addition, a summary report provided by Oppenheimer & Co. Inc. on Mar.16th, 2015 documented that investors have increased their holdings on fixed income securities after the 2007-2008 financial crisis, which almost doubled from 2007 to 2013. Given the rapid expansion of bond market and the ever-increasing size of average household holdings of fixed income securities, even the fluctuation of a few basis points would introduce a big wealth increase/decrease to the investors. In the meantime, the same basis points change on the bond return could save or cost the issuing company thousands or even millions more.

Given the importance of bond market as a significant source of external capital, a lot of extant studies such as Fama and French (1993) and Elton et al. (2001) suggest a couple of factors that determine cross-sectional bond returns while other studies such as Sengupta (1998) presents empirical evidence on how corporate practices, e.g., corporate disclosure quality affects the cost of debt capital. As an extension, the objective of this study is to

examine several additional factors that affect either the returns to a firm's bondholders or the cost for a firm to raise capital through the credit market.

1.2. Research objectives and research questions

The dissertation consists of three studies, described briefly below.

Study 1 investigates whether conglomerate and standalone firms offer fundamentally different returns to their bondholders. Over the past two decades, an increasing number of corporations become large conglomerates by expanding into multiple industries. In this study, we investigate whether this trend yields any impact on bond returns based on a sample of bonds from 1994-2015. Literature has presented mixed views about the benefits/costs of corporate diversification. On one hand, Berger and Ofek (1995) show that there's a value loss when firm diversifies. They argue that this value loss is caused by overinvestments and cross-subsidization internally. Rajan, Servaes, and Zingales (2000) provides further evidence in support of this diversification cost argument by showing an inefficient internal capital allocation when firm diversifies. On the other hand, Campa and Kedia (2002), together with a few other papers such as Villalonga (2004), argues that after controlling for endogeneity, the so-called diversification discount vanishes. To reconcile the discrepancy through the perspective from the bond market, we intend to answer the following research question in study 1: *Would diversification affect the return for bondholders? Is there any diversification discount reflected through the credit market?*

Study 2 intends to look at the impact of a firm's operating cash flow restatement on its cost of debt capital. Previous literature focuses on the impact of earnings restatement events on stockholder wealth and the cost of equity. It has been well documented that earnings restatement results in a significant drop in the firm's market. Due to the widespread belief

among analysts and investors that cash flows are more difficult to manipulate than earnings, there's very limited literature on how operating cash flow restatement impacts the firm's cost to raise capital through external market. Recently, Lee (2012) provides a couple of motivations for the managers to manipulate operating cash flow. Since cash flows are considered as an important factor of credit risk (see Beaver 1966, Ohlson 1980, and DeFond and Hung 2003) and therefore credit ratings (Standard & Poor's, 2008), I posit that restatement of operating cash flows is likely to have a profound effect on the cost of debt capital. Furthermore, interest payments to creditors are generated from operating cash flows, thus restatement events that affect operating cash flows in particular draw great attention from creditors. So we intend to answer the following research questions in study 2: *How does the restatement of operating cash flow affect a firm's cost of debt capital?*

Study 3 focuses on the impact of managerial voluntary disclosure on a firm's cost of debt capital. In particular, since earnings is a crucial indicator of a firm's profitability, I look at how the voluntarily provided managerial earnings forecast affect a firm's cost of debt capital. Based on extant literature, managers have several motivations to provide voluntary disclosures. For example, Diamond and Verrecchia (1991) lays out a theory where voluntary disclosure help draw attention from a larger investor base thus increase the liquidity of the securities issued by the firm, which eventually help reduce the cost of capital. Given the fact that debt market is also an important market where firms seek funding from creditors besides equity holders, it's worth extending the investigation of voluntarily disclosed managerial forward-looking earnings estimates to a firm's cost of debt. If any new information has been released to the market through managerial earnings forecast, the bond market should also respond to this new information about future

expected cash flow. To fill in this gap, we intend to answer the following research questions in study 3: *How does managerial earnings forecast affect a firm's cost of debt capital?*

1.3. Organization of the dissertation

The dissertation is organized as follows: Chapter 2 presents the study of bond returns from standalone firms versus conglomerates. Chapter 3 demonstrates how financial restatements affect a firm's cost of debt capital. Chapter 4 shows how managerial voluntary disclosures affect a firm's cost of debt capital.

CHAPTER 2: STANDALONE FIRMS, CONGLOMERATE, AND BOND RETURNS

2.1. Introduction

Active bond portfolio managers believe that excess returns can be generated by actively monitored strategies, taking advantage of, for instance, the shape of the yield curve (Pelaez (1997) and Galvani and Landon (2013), the "riding the yield curve" strategy) or business cycle and changes in short-term interest rates (Boyd and Mercer (2010), the "spread trade" strategy). These strategies mainly rely on the characteristics of the yield curve and macroeconomic conditions.

Other empirical work, such as Fama and French (1993), incorporates a set of broad market factors that are related to maturity and default risks as the determinants of bond returns. Elton et al. (2001) examine rate spreads between corporate and government bonds and suggest that systematic risk factors related to expected equity returns are of primary importance in the determination of these spreads. They find that rate spreads on corporate bonds are largely attributable to three factors: possible loss from default, tax differential between corporate and government bonds, and systematic risk of the equity market. Thus, they conclude that market factors explaining equity returns are important determinants of yield spreads on corporate bonds as well. Similarly, Collin-Dufresne et al. (2001) show that most of the time-series variation in corporate bond yield spreads is related to movement in the aggregate corporate bond market. In a more recent paper, Gebhardt et al. (2005) examine whether individual bond characteristics are better at explaining the cross-

sectional variation in bond returns than maturity and default risk factors. Among the characteristics they examine (duration, rating, and yield to maturity), they find that only yield to maturity is significant in explaining the cross-sectional variation in bond returns after controlling for default and term factors. In this paper, we explore other potential factors that can help explain the cross-sectional bond returns, e.g. corporate diversification.

Literature has presented mixed views about the benefits/costs of corporate diversification. Lang and Stulz (1994) is one of the first papers discussing diversification discount. They show under several different diversification measures, firm's level of diversification is negatively correlated with firm's q. By imputing standalone firm values for each segment under a conglomerate, Berger and Ofek (1995) also presents evidence that there's a value loss when firm diversifies. They argue that this value loss is caused by overinvestments and cross-subsidization internally. Rajan, Servaes, and Zingales (2000) further provides empirical evidence that the diversification cost is also caused by inefficient internal capital allocation, e.g., cash flow can flow to the most inefficient division when there's a diversity within the firm. Besides these empirical work, Scharfstein and Stein (2000) developed an agency model which indicates the agency costs present for conglomerates when facing inefficient internal capital market allocation.

On the other hand, there's another strand of literature which argues that the "well-documented" diversification discount is invalid. For example, Campa and Kedia (2002) posits that the choice to diversify is purely an endogenous decision. Therefore, as long as endogeneity is modeled, diversification becomes a self-selection process and the diversification discount disappears. Similarly, Villalonga (2004) used propensity score

matching as well as Heckman two-stage estimator, yet he failed to find any evidence that diversification destroys value.

However, more recent literature which adopt miscellaneous up-to-date econometrics methodology to account for endogeneity issues still find the prevalence of diversification discount. For example, after accounting for endogeneity using Heckman and dynamic panel GMM, Hoechle et al. (2012) finds diversification discount can partially be explained by poor corporate governance variables.

So, is there any diversification discount/premium reflected through corporate debt? Mansi and Reeb (2002) provides an explanation that the diversification discount is introduced by risk-reducing effects through diversification. They propose a wealth-transfer story that while diversification destroys firm value thus reduces shareholder value, it enhances bondholder value due to the lowered firm-risk due to diversification. They empirically found two pieces of evidence. First, all equity firms do not exhibit diversification discount; Second, book values of debt are more downward adjusted compared with the market value of debt for diversified firms, relative to undiversified firms. So their conclusion is although diversification reduces shareholder value, it increase bondholder value, thus has no impact on the overall value of the firm. A more recent paper, Ammann et al. (2012) considered the endogeneity problem mentioned earlier and finds evidence in support of a significant diversification discount, although the difference between market value of debt and book value of debt only accounts for a small fraction of the diversification discount.

In this paper, we empirically investigate if and how bond returns are related to business concentration, which is an important characteristic that has not been explored in the

literature. Using a sample of bonds over the period from 1994 to 2015, we find that bonds issued by firms doing business in a single industry (i.e. a standalone firm) have lower returns than those by firms that diversify their business across multiple industries (i.e. a conglomerate firm). The result remains significant based on the analysis of the returns of the individual bonds and those of the market value-weighted portfolios. We divide the sample by business concentration and construct two market value-weighted portfolios: one portfolio consisting of standalone bonds and the other consisting of conglomerate bonds. Assuming a buy-and-hold strategy over the sample period, the standalone portfolio earned a lower return than the conglomerate portfolio except for the initial recovery years after the recent 2007-2008 financial crisis. Due to a lack of diversification, the standalone portfolio experienced an increase in return volatility during the downturn. We explore the differences in issue characteristics between standalone and conglomerate bonds. It is interesting to note that standalone bonds tend to have a higher coupon rate, a smaller issue size, lower rating and a shorter maturity. We further examine whether standalone bonds provide lower returns than conglomerate bonds using a set of multivariate analysis. We show that returns of standalone bonds are significantly lower than conglomerate bonds after controlling for bond and issuing firm characteristics, bond market systematic risk factors, and Fama-French risk factors.

To understand what causes the return differential between standalone and conglomerate bonds, we develop and test the following hypothesis: the return differential between standalone and conglomerate bonds can be explained by the level of business concentration. In particular, diversification reduces return volatility and therefore leads to a lower return. Our results show that there is a significant decrease in bond returns when

firms diversify from single to multiple industries. Interestingly, the effect of diversification becomes nonlinear within the conglomerate sample: Diversification has a minimal effect or even leads to a higher return for bonds issued by firms with a higher degree of diversification. This finding suggests that diversification leads to a significant reduction in return volatility when a firm initially expands from one core to multiple markets. The effect quickly diminishes and results in greater return volatility for an existing conglomerate that pursues further diversification. This finding coincides with the diversification discount literature where the value-reducing effect of diversification has been suggested and supported by empirical evidence (e.g., Berger and Ofek (1995)). The value loss associated with diversification may be due to reasons such as inefficient internal resource allocation and more severe agency problems (Rajan et al. (2000); Laeven and Levine (2007)). The nonlinear relationship between the degree of diversification and bond return can be attributed to the value-reducing effect of diversification.

The rest of the paper proceeds as follows. We describe the data sources and sample in Section 2.2. In Section 2.3, we examine the performance of standalone and conglomerate bonds using market value-weighted portfolios. We also present the results of multivariate regressions on how business concentration affects bond returns after controlling for bond and issuing firm characteristics, liquidity measures, bond market systematic factors, and equity market factors. Furthermore, we perform empirical tests to explore the two proposed hypotheses. We conclude in Section 2.4.

2.2. Data and sample construction

Data on corporate bond issues are collected from the Mergent's Fixed Income Securities Database (FISD) for the period from 1993 to 2015. Corporate bond pricing data

for the sample period are obtained from the National Association of Insurance Commissioners (NAIC) for the period from 1994 to 2015 and from the Financial Industry Regulatory Authority's (FINRA)'s TRACE from 2002 to 2015. For bond ratings, we use Moody's ratings as the primary source and S&P's ratings as the supplemental source. We drop bond issues with floating coupon payments.

For each bond transaction, we calculate the full price based on accrued interest and flat price. We use the average price to represent the trade price for the day if a bond has multiple transactions on a given day. We require each bond to have at least two valid transactions in a given year to be included in the sample. We also include those bonds with one transaction in its issuance year as long as we have a valid offer price at the time of issuance. We use the full prices of the first and last available transactions in a given calendar year to calculate the holding period return as

$$Holding\ Period\ Return = \frac{(P_2 + AI_2) + C - (P_1 + AI_1)}{(P_1 + AI_1)} \tag{2.1}$$

where P2 and AI2 are the last available transaction price and accrued interest respectively, P1 and AI1 are the first available transaction price and accrued interest respectively, and C is the coupon paid between times 1 and 2. We then annualize the holding period return from equation 2.1 to obtain each bond's annual return. For those bonds with more than two transactions in a given year, we use an alternative method to estimate the annual return as a robustness check. In particular, we calculate the annualized return using each pair of consecutive transactions and take the average of the annualized returns of all pairs in a given year. The results based on the alternative method are similar to those using the first and last available transactions. For brevity, we report the results using the returns calculated from the first and last trades in a given year.

In addition to individual bond returns, we construct a market value-weighted bond portfolio at the beginning of each year and measure its annual return. Market value of a bond is calculated at the end of the previous year as the product of the dollar amount outstanding and full price associated with the last available transaction.

We determine whether a bond is issued by a standalone firm or a conglomerate operating in multiple industries based on the information from Compustat Industrial Segment database. We applied two filters when constructing this data. First, we only keep non-missing segment Standard Industry Classification (SIC) code(s) and sales. Second, we require the sum of segment sales to be within 1% of the total firm-level sales to eliminate potential reporting errors in Compustat. Then, we match our bond issue sample with this filtered Compustat segment data using 6-digit issuer CUSIP. We only keep the sample of bonds whose issuer have identifiable information from Compustat. We classify the bonds issued by firms with a single segment or multiple segments under the same 4-digit SIC code as standalone bonds, and the remainder as conglomerate bonds.

We also obtain firm-level accounting data from Compustat in order to control for several firm-specific characteristics in later analysis. Specifically, we control for firm size, growth opportunities, and default risk in our baseline analysis. We use natural log of the book value of total assets to proxy for firm size, market-to-book, as measured by the ratio of books assets plus the difference between the market and book values of equity to book value of assets, to capture the firm's growth opportunities, and market leverage, as measured by the ratio of book value of debt to market value of total assets, to measure the firm's default risk. All the firm-specific characteristics are measured in the previous fiscal year of each bond-year observation. In addition, we use a set of firm characteristics in

robustness checks listed as follows. We use an alternative measure of firm size, which is the natural log of firm's total sales in a given year. Earnings volatility is the standard deviation of a given firm's EBIT in the previous three years. Sales growth is the annual sales growth. Free cash flow is operating income before depreciation minus interest and tax expenses as well as capital expenditure then standardized by the book value of total assets. Return on assets (ROA) is operating income before depreciation divided by total assets. Z-score for manufacturing firms is 1.2 × (working capital/assets) + 1.4 × (retained earnings/assets) + 3.3 × (EBIT/assets) + 0.6 × (market value of equity/book value of total liabilities) + 0.999 × (sales/assets). Z-score for non-manufacturing firms = 6.56 × (working capital/assets) + 3.2 × (retained earnings/assets) + 6.72 × (EBIT/ assets) + 1.05 × (market value of equity/ book value of total liabilities). Working capital used here is calculated as current assets minus current liabilities.

For each bond, we collect information on amount outstanding, age, maturity, rating, coupon, trading volume, and number of trades every year. Trading volume for a given year is defined as the sum of all NAIC and TRACE trading volumes divided by amount outstanding. Number of trades is the total number of trades (measured in thousands) reported in NAIC and TRACE for a given year. Following Fama and French (1993), we also consider the effects of the general bond and equity market factors on bond returns. From the Federal Reserve Economic Data (FRED) at the Federal Reserve Bank of St. Louis, we obtain the following rates: monthly Moody's seasoned Aaa corporate bond yields, monthly Moody's seasoned Baa corporate bond yields, monthly 10-year treasury constant maturity rates, monthly 1-year treasury constant maturity rates, and weekly 3-month Treasury bill secondary market rates. In addition, we collect annual data on the risk-

free rate and three Fama-French factors from Kenneth French's website. By requiring each bond-year observation to contain valid information on bond return and the above variables, we arrive at a final sample of 49,078 bond-year observations from 1994 to 2015. Year 1994 has the smallest number of observations with 897 bond-year observations, while 2015 has the largest number with 3,529 bond-year observations.

2.3. Empirical analysis

2.3.1. Bond return and the level of business concentration

In Table 2.1, we provide the summary statistics of standalone bonds and conglomerate bonds at both the bond level and the bond-year level. Panel A presents the comparison of bond issuing characteristics, it shows the standalone bonds offers higher coupon, shorter maturity and are issued in smaller size compared to conglomerate bonds. Panel B presents the comparison of bond-year characteristics. We notice that standalone bonds are less frequently traded in the market. In addition, standalone bonds are traded in smaller sizes. Furthermore, standalone bonds have lower ratings, smaller amount outstanding and relatively younger.

Next, we first divide the sample into two subgroups: bonds issued by standalone firms and bonds issued by conglomerate firms. In addition, we also divide the sample period into five subperiods: 1994-1999, 2000-2005, 2006-2008, 2009-2012 and 2013-2015. The first period is before the millennium, the second period covers the first half of the 2000s, the third is the financial crisis period, the fourth period is the recovery immediately after the crisis, and the most recent years are grouped in the fifth period. We form a market value-weighted portfolio using all bonds in the standalone subsample, and a market value-weighted portfolio consisting of bonds in the conglomerate subsample. For

each portfolio, we calculate the annualized holding period return for a given investment period. The return comparison of the two market value-weighted portfolios by investment period is shown in Table 2.2. In Panel A of Table 2.2, we report the results based on the overall sample. Over the sample period from 1994 to 2015, the average annual return is 6.77% for standalone market value-weighted portfolio and 6.81% for conglomerate market value-weighted portfolio. In Panel B of Table 2.2, we present the results based on the subperiods. In particular, the standalone market value-weighted portfolio outperforms conglomerate market value-weighted portfolio in two of the five subperiods: 6.94% vs. 6.43% in 1994-1999 (an outperformance of 51 basis points), 13.62% vs. 11.73% in 2009-2012 (an outperformance of 189 basis points); the standalone market value-weighted portfolio underperforms conglomerate market value-weighted portfolio in the rest three subperiods: 6.56% vs. 7.43% in 2000-2005 (an underperformance of 87 basis points), 2.71% vs. 4.18% in 2006-2008 (an underperformance of 147 basis points), and 1.77% vs. 2.41% in 2013-2015 (an underperformance of 64 basis points). It is interesting to observe that the standalone portfolio has a much lower return than the conglomerate portfolio during the financial crisis yet they come back with a much higher return than the conglomerate portfolio right after the crisis. The result suggests due to lack of diversification, standalone bonds were hit harder by the financial crisis than the conglomerate bonds. We explore this issue further by examining the return comparison by year as shown below.

In Figure 2.1, we present the comparison between market value-weighted standalone and conglomerate bond portfolio returns by year. Not surprisingly, the financial crisis had a significant and negative impact on the returns of both groups in 2007 and 2008. This

unfavorable impact was more pronounced for standalone bonds than for conglomerate bonds. Although the standalone bonds suffered a larger loss from the crisis than the conglomerate bonds, its performance bounced back in a much stronger manner. Interestingly, the magnitude of the return difference in 2009 is the largest during the 22-year sample period, and it well exceeds the size of the prior year's underperformance. We conjecture that the general pattern of higher return and the strength of recovery from crisis are due to simpler capital and organizational structures of standalone firms (Laeven and Levine (2007)). Although they suffer from the financial crisis more severely than conglomerate firms due to the lack of diversification, they recover more quickly as they are able to respond to the crisis in a more efficient way. For example, in light of the change in the economic environment they can make timely adjustments to current business strategies or adopt new strategies, which may be executed more swiftly and at a lower cost due to its less complicated business structure. This explanation is consistent with the implications of Cohen and Lou (2012). In particular, Cohen and Lou (2012) suggest that due to a much simpler corporate structure, the stock price of a standalone firm can reflect new industry or macroeconomic information more efficiently than that of a conglomerate. As a result, standalone firms exhibit greater stock return predictability than conglomerates[1]. Their finding lends support to the notion that the complication in information processing for conglomerates leads to a delay in their stock price reaction to external shocks. Finally, our result adds to the findings of Chatrath et al. (2012) that corporate bonds are more sensitive to negative economic shocks than positive shocks. More importantly, we show

[1] In Cohen and Lou (2012), they introduce a profitable portfolio strategy by trading the conglomerate stocks and those of the "pseudo-conglomerate" consisting of the standalone firms from the corresponding industries in the conglomerates.

that standalone bonds are more sensitive to negative economic shocks than conglomerate bonds.

2.3.2. Return differential between standalone and conglomerate bonds: diversification explanation

Previous discussion suggests that standalone bonds react to shocks in a more volatile manner than conglomerate bonds, implying a larger return volatility. Thus, we expect a higher return in bonds issued by standalone firms to compensate for the greater volatility. In other words, diversification reduces volatility and therefore leads to a lower bond return for conglomerates. We conjecture that return decreases as the issuing firm spans into multiple industries. And we form the following business concentration hypothesis as a possible explanation for the difference in return between standalone and conglomerate bonds: *The higher return of standalone bonds can be explained by greater return volatility associated with issuers that have a higher level of business concentration. Bond return is expected to decrease as an issuer becomes more diversified.*

To explore the factors driving the difference in bond returns between standalone and conglomerate bonds, we examine the impact of level of business concentration on bond returns as well as bond characteristics of the two groups and present the results in Table 2.3. In Panel A of Table 2.3, we present the mean, median and standard deviation of bond return by the number of SIC codes.[2] In particular, we divide the conglomerate sample into four subgroups: two SIC codes/segments, three SIC codes/segments, four SIC codes/segments and those with more than four SIC codes/segments. Column 1 shows the return statistics for the standalone bonds issued by firms with a single SIC code, column

[2] In this analysis, we exclude the observations without valid information on SIC codes.

2/3/4 presents the results for bonds issued by firms with two/three/four SIC codes, and column 5 reports those for bonds issued by firms with more than four SIC codes. We find that standalone bonds provides higher returns than conglomerate bonds that are issued by firms with two SIC codes: the difference in mean return between columns (1) and (2) is 45 basis points. Interestingly, we do not find a monotonically decreasing pattern in returns as the number of SIC codes increases, e.g., conglomerate bonds issued by firms with three SIC codes provides higher returns than conglomerate bonds issued by firms with two SIC codes, which is indicated by the difference between columns (3) and (2), 19 basis points. This indicates a kink in bond returns as the firm increases its diversification level. Specifically, the finding suggests that the drop in returns as issuers diversify, which is likely due to a decrease in return volatility, is the greatest when a single-industry firm decides to venture into one additional industries. The diversification effect on return and volatility quickly diminishes if an issuer is already operating in multiple industries. For a company with businesses in three industries to expand to operate in four or more industries, we conjecture that the effect of diversifying may be confounded by the impact of increased complexity in organizational structure and information asymmetry due to the expansion. Our finding and its implication are consistent with the diversification discount literature where the value-reducing effect of diversification has been well-documented (e.g., Berger and Ofek (1995)). The value loss in the diversification process may be due to reasons such as inefficient internal resource allocation and more severe agency problems (Rajan, Servaes, and Zingales (2000); Laeven and Levine (2007)). The nonlinear relationship between the number of SIC codes and bond returns can be explained by the value reduction effect associated with diversification.

To examine if bond characteristics help explain the difference in return between standalone and conglomerate bonds, we divide the sample into halves based on the annual median value of each of the three bond characteristics: coupon, maturity, rating, age, bond size (or amount outstanding), and callability. The results are presented in Panel B of Table 2.3. Coupon is the bond's coupon rate in percentage. Maturity is the time to maturity in months, while age is the number of months since issuance. Bond rating from Moody's/S&P ranges from 1 for the highest rating of Aaa+/AAA+ to 11 for the lowest investment grade rating of Baa3/BBB-. Amount outstanding is the natural log of dollar amount outstanding. Callability is a dummy variable that equals to 1 if the bond is callable. Definitions of these and the other variables introduced in later sections are summarized in the Appendix. The results show that bond returns are significantly different between standalone and conglomerate bonds only in the subgroups with higher coupon rate and shorter maturity, or bonds that are more seasoned (older age) and callable. We also perform the difference in difference tests to see whether the return differential between standalone bonds and conglomerate bonds is linked to any of the bond characteristics. The results suggest that return differential between standalone and conglomerate is not likely to be driven by any of the bond characteristics tested here except maturity.

2.3.3. Multivariate analysis

In this section, we examine whether business concentration is associated with bond returns in a multivariate framework with control variables including bond and issuing firm characteristics, bond market systematic factors, and equity market risk factors. In particular, we use a dummy variable, Single, which equals 1 if a bond is issued by a standalone firm and 0 otherwise. For bond characteristics, we include Coupon, Maturity,

Rating, Callable, and Sinking fund. To consider the effects of liquidity, we employ three measures including Age, Amount Outstanding, and Trading Volume.[3] We also include three firm-specific factors: firm size (measured by the logarithm of firm's book value of total assets), market to book (ratio of book assets plus the difference between the market and book values of equity to book assets), and market leverage (the ratio of book value of debt to market value of total assets). To control for bond market systematic factors, we include Interest Rate (the annual risk-free rate from Kenneth French's website), Slope (yield curve slope measured by the difference between the 10-year and 1-year Treasury constant maturity rates), Interest Rate Volatility (measured by the standard deviation of 3-month Treasury bill rates), and Default Risk (market credit premium measured by the difference between the Moody's seasoned Baa and Aaa corporate bond yields). We use the Fama-French factors (Market Risk Premium, SMB, and HML) to proxy for the equity market risk factors. As bond characteristics and bond market systematic factors are the main drivers of yield and duration, we do not include yield and duration as additional explanatory variables in the regression model. The regression model is structured as follows:

$$\begin{aligned} Bond\ Return = {} & \alpha + \beta \times Single + \gamma \times Bond\ Characteristcs + \zeta \\ & \times Firm\ Characteristics + \delta \times Bond\ Market\ Factors + \chi \\ & \times Equity\ Market\ Factors + \varepsilon \end{aligned} \tag{2.2}$$

The regression results of bond returns on Single and control variables are presented in Table 2.4. Model 1 and 2 are estimated with robust standard errors. We repeat the analysis with clustered standard errors estimated at the firm level in model 3 and 4 and find similar

[3] We use Number of Trades as an alternative liquidity measure to replace Trading Volume in the multivariate regressions and obtain similar results.

results. We find that the Single dummy has a negative and significant impact on bond returns across all models. This finding indicates that business concentration plays a crucial role in driving the cross-sectional variation in bond returns after controlling for bond and firm characteristics and systematic risk factors associated with the bond and equity markets. In addition, we have the following notable findings on the control variables. First, Coupon and Maturity have a positive effect on bond returns. Second, bond market systematic factors, including Interest Rate, Slope, and Default Risk are all positively related to bond returns. However, greater interest rate volatility is associated with lower bond returns. Lastly, consistent with previous literature, we find that all three Fama-French factors are crucial drivers of the cross-sectional variation in bond returns.

However, the choice of being a standalone firm or a conglomerate may reflect the result of an endogenous decision. Therefore, we perform two additional robustness tests to address this endogeneity problem. Particularly, we do an IV regression as well as a propensity score matching. In the first step of IV regression, we run a probit with the following firm-level control variables: logarithm of firm's total sales as well as firm's annual sales growth, market to book ratio, market leverage, earnings volatility, free cash flow and z-score. The results of IV regression is presented in Table 2.5. And we see that the negative coefficient for single dummy remains and is significant at a 10% level. Furthermore, we report the results based on propensity score matching in Table 2.6. The idea of propensity score matching is to find two firms that are otherwise similar except one is a standalone firm while the other is a conglomerate. In Panel A, we present the results of the first step or propensity score matching, which is a probit regression. The same set of firm-level control variables are used as in the first step of IV regression. In Panel B, the

results show that the standalone bonds provide a return of 8.42% compared to their conglomerate bonds counterparty which provide a return of 9.17%. In addition, it's shown that the 75 basis points extra return provided by conglomerate bonds is significant at a 5% level.

Since we posit that the return differential between standalone bonds and conglomerate bonds can be explained by the business concentration of standalone firms. As discussed above, diversification may reduce volatility and therefore lead to lower returns. We test this hypothesis in a multivariate framework and present the regression results in Table 2.7. In this table, we use the number of different SIC codes to represent the level of diversification. Following the same setting as our baseline regressions in Table 2.5, model 1 and 2 are estimated with robust standard errors while model 3 and 4 are estimated with standard errors clustered at firm level. The coefficient of the number of SIC codes is positive and significant at the 10% level across all four models, indicating an additional SIC code results in an increase in bond return by 20 or 27 basis points depending on the underlying model. This offers strong support to the diversification discount literature: the higher the diversification level, the higher bond return is offered to the credit holders as a compensation.

To examine the diversification effect further, in Table 2.8, we adopt four dummy variables to denote the level of diversification: 2/3/4 segments equals 1 when the issuing firm has two/three/four SIC codes, 0 otherwise; where 5 segments or above equals 1 when the issuing firm has five or more SIC codes, 0 otherwise. The omitted category is the standalone issuers. We find that the coefficient on 2 segments is negative and significant at the 10% level when all the control variables are used, but the coefficient on 3 segments,

4 segments, and 5 segments or above are positive. Furthermore, the coefficient on 3 segments and 5 segments or above are significant at the 10% level. The above findings suggest that there is a significant drop in bond return when firms diversify from single industry to two industries. However, there is a significant increase in bond returns returns when the firm increases its diversification level to three industries, for example. This indicates that diversification leads to a significant drop in bond returns when a firm initially diversifies from single industry to conglomerates. However, once the firm becomes a multi-industry company, further diversification exhibits a minimal effect on bond returns and eventually turns out to increase the return to bond holders. The multivariate results provide further confirmation for the nonlinear relation between the number of SIC codes and bond returns shown in the aforementioned univariate analysis: The volatility-reducing effect is confounded by the value loss of diversification as a result of a more complex organizational structure and more severe agency problems. Our findings yield strong support for the diversification discount literature (Berger and Ofek (1995); Rajan, Servaes, and Zingales (2000); Laeven and Levine (2007)).

2.4. Conclusion

In this study, we examine how the level of business concentration affects the returns of corporate bonds and bond portfolios. We use a sample of investment grade bonds from 1994-2015 and find that bonds issued by standalone firms have lower returns than bonds issued by conglomerates. The lower return is prominent throughout the sample period, except during the financial crisis. The multivariate analysis confirms that bonds issued by standalone firms provide higher returns after controlling for bond and firm characteristics, liquidity measures, and bond and equity market systematic factors.

We conjecture that the higher return of standalone bonds is explained by the level of business concentration. We find a significant drop in return when a company initially ventures from single to multiple industries. Interestingly, as conglomerates diversify further, the volatility-reducing effect quickly diminishes and even leads to greater return and volatility due to diversification discount.

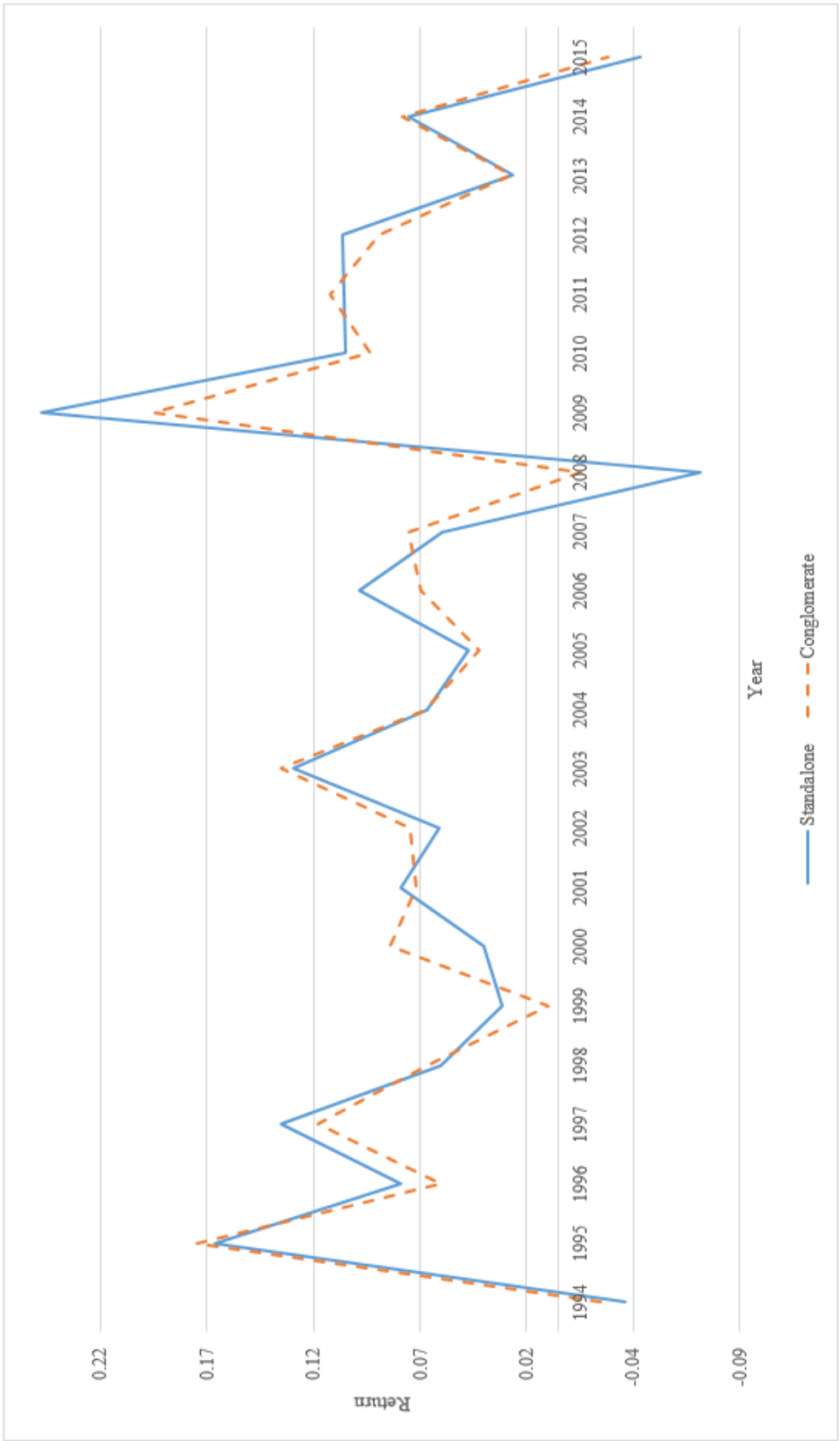

Figure 2.1: Market value-weighted bond portfolio return by year

Table 2.1: Descriptive statistics of bond characteristics

This table reports the descriptive statistics of bond characteristics on bond-level (Panel A) and bond-year level (Panel B). Coupon is coupon rate in percentage. Maturity is the time to maturity at issuance in years. Issue size is the bond issuing dollar amount in millions. Amount outstanding is the dollar amount outstanding in millions. The definitions of the variables are in the Appendix. T-test is performed for the mean difference test. Wilcoxon signed rank test is performed on the median difference test. The symbols *, **, *** denote significance at the 10%, 5% and 1% levels, respectively.

Panel A: Bond-level Descriptive Characteristics

	Full Sample (N=14,346)		Single (N=6,794)		Multiple (N=7,552)		Single - Multiple	Single - Multiple
	Mean	Median	Mean	Median	Mean	Median	(Mean)	(Median)
Coupon (%)	6.3543	6.5000	6.5291	6.6250	6.1970	6.3750	0.3321***	0.2500***
Maturity	12.5774	10.0000	12.3416	9.9863	12.7886	10.0082	-0.4470***	-0.0219***
Issue Size (in millions)	384.4950	250.0000	324.5360	225.0000	438.1950	300.0000	-113.6590***	-75.0000***
Callable	0.7302	1.0000	0.7048	1.0000	0.7529	1.0000	-0.0481***	0.0000***
Sinking fund	0.0206	0.0000	0.0243	0.0000	0.0173	0.0000	0.0070***	0.0000***

Panel B: Bond-year Descriptive Characteristics

	Full Sample (N=49,078)		Single (N=23,597)		Multiple (N=25,481)		Single - Multiple	Single - Multiple
	Mean	Median	Mean	Median	Mean	Median	(Mean)	(Median)
Rating	10.5750	9.0000	11.2745	9.0000	9.9272	9.0000	1.3473***	0.0000***
Age	3.4008	2.0833	3.3755	1.9167	3.4243	2.2500	-0.0488	-0.3333***
Amount Outstanding (in millions)	360.7803	250.0000	322.8608	250.0000	395.8962	269.0350	-73.0354***	-19.0350***
Trading Volume	0.4269	0.2533	0.4175	0.2382	0.4355	0.2681	-0.0180***	-0.0299***
Number of Trades	339.5161	56.0000	275.2626	41.0000	399.0190	75.0000	-123.7564***	-34.0000***

Table 2.2: Bond returns of standalone and conglomerate issuers by market value-weighted portfolio

This table reports the mean and median market value-weighted portfolio return of standalone (single) and conglomerate (multiple) bonds. Panel A shows the comparison of the overall sample. Panel B shows the comparison by sub-periods. T-test is performed for the mean difference test. The symbols *, **, *** denote significance at the 10%, 5% and 1% levels, respectively.

Panel A: Overall Sample

	Return	Std. Err	Median	N
Single	0.0677	(0.0675)	0.0661	22
Multiple	0.0681	(0.0547)	0.0683	22
All	0.0679	(0.0599)	0.0640	22

Panel B: By Sub-period

	1994~1999			2000~2005			2006~2008			2009~2012			2013~2015		
	Single	Multiple	All	Single	Multiple	All	Single	Multiple	All	Single	Multiple	All	Single	Multiple	All
Return	0.0694	0.0643	0.0666	0.0656	0.0743	0.0704	0.0271	0.0418	0.0347	0.1362	0.1173	0.1262	0.0177	0.0241	0.0209
Std. Err	(0.0697)	(0.0696)	(0.0693)	(0.0319)	(0.0307)	(0.0298)	(0.0835)	(0.0450)	(0.0623)	(0.0708)	(0.0495)	(0.0586)	(0.0543)	(0.0486)	(0.0515)
Median	0.0644	0.0588	0.0615	0.0589	0.0683	0.0629	0.0546	0.0650	0.0627	0.1012	0.0978	0.0992	0.0211	0.0220	0.0216
N	6	6	6	6	6	6	3	3	3	4	4	4	3	3	3

Table 2.3: Bond returns by business concentration and bond characteristics

This table reports bond returns comparison between standalone (single) and conglomerate (multiple) bonds by business concentration and bond characteristics. Panel A reports the bond returns among five sub-samples (single, 2 segments, 3 segments, 4 segments, and 5 segments or above). Panel B reports bond returns comparison by bond characteristics (coupon, maturity, rating, age, amount outstanding, and callable). The definitions of these variables can be found in the Appendix. T-test is performed for the mean difference test. The symbols *, **, *** denote significance at the 10%, 5% and 1% levels, respectively.

Panel A: By Business Concentration

	Single	2 Segments	3 Segments	4 Segments	5 Segments or above
Return	0.0852	0.0807	0.0871	0.0761	0.0702
Std. Err	(0.3368)	(0.3002)	(0.3166)	(0.2778)	(0.2467)
Median	0.0584	0.0585	0.0566	0.0565	0.0527
N	23,597	3,203	7,187	5,853	4,547

Note: The return difference between single and 4 segments is 0.0091 (10% significance level). The return difference between single and 5 segments or above is 0.015 (1% significance level). The return difference between 3 segments and 4 segments is 0.011 (5% significance level). All the other return difference pairs are insignificant.

Panel B: By Bond Characteristics

Bond Characteristics		Single		Multiple		Single-Multiple (Mean)	Difference of Difference
		Mean	N	Mean	N		
Coupon	>= Median	0.0914	11,727	0.0846	13,178	0.0068*	0.0012
	< Median	0.0791	11,870	0.0736	12,303	0.0055	
Maturity	>= Median	0.0827	11,774	0.0837	12,957	-0.0010	-0.0140**
	< Median	0.0877	11,823	0.0747	12,524	0.0130***	
Rating	>= Median	0.0959	13,898	0.0890	13,701	0.0069	0.0050
	< Median	0.0700	9,699	0.0680	11,780	0.0019	
Age	>= Median	0.0906	11,530	0.0805	13,350	0.0101***	0.0080
	< Median	0.0801	12,067	0.0780	12,131	0.0021	
Amount Outstanding	>= Median	0.0734	11,785	0.0688	14,656	0.0046	0.0011
	< Median	0.0970	11,812	0.0935	10,825	0.0035	
Callable	Callable	0.0813	16,843	0.0951	6,754	-0.0138*	-0.0007
	Noncallable	0.0756	18,306	0.0887	7,175	-0.0131	

Table 2.4: Effect of business concentration on bond return

This table reports regression results of the effect of business concentration on bond return. The dependent variable is the annualized bond return. Definitions of the depending and all explanatory variables are summarized in the Appendix. Model (1) and (2) are estimated using Huber-White robust standard errors. Model (3) and (4) are estimated using robust standard errors clustered at the firm level. T-statistics are in parentheses. The symbols *, **, *** denote significance at the 10%, 5% and 1% levels, respectively.

	(1)	(2)	(3)	(4)
Constant	-0.0985***	-0.1120**	-0.0985**	-0.1120**
	(-2.84)	(-2.18)	(-2.32)	(-1.97)
Single	-0.0066**	-0.0085**	-0.0066**	-0.0085**
	(-2.44)	(-2.49)	(-2.10)	(-2.11)
Coupon	0.0011	-0.0007	0.0011	-0.0007
	(1.19)	(-0.60)	(1.05)	(-0.53)
Maturity	0.0007***	0.0006***	0.0007***	0.0006***
	(4.70)	(3.44)	(4.43)	(3.11)
Rating	0.0044***	0.0042***	0.0044***	0.0042***
	(12.46)	(8.33)	(10.38)	(6.20)
Age	0.0019***	0.0025***	0.0019***	0.0025***
	(4.86)	(4.41)	(3.23)	(3.80)
Amount Outstanding	-0.0085***	-0.0091***	-0.0085***	-0.0091***
	(-5.42)	(-3.21)	(-4.31)	(-2.61)
Callable	-0.0009	0.0036	-0.0009	0.0036
	(-0.23)	(0.76)	(-0.23)	(0.69)
Sinking Fund	-0.0162	-0.0202	-0.0162	-0.0202
	(-1.18)	(-1.15)	(-1.19)	(-1.09)
Trading Volume	-0.0064**	-0.0088***	-0.0064*	-0.0088**
	(-2.07)	(-2.62)	(-1.75)	(-2.40)
Interest Rate	0.0262***	0.0296***	0.0262***	0.0296***
	(14.20)	(13.78)	(12.85)	(12.76)
Slope	0.0512***	0.0550***	0.0512***	0.0550***
	(15.00)	(13.93)	(11.43)	(11.10)
Interest Rate Volatility	-0.0096	-0.0184**	-0.0096	-0.0184*
	(-1.20)	(-2.01)	(-1.03)	(-1.72)
Default Risk	0.1190***	0.127***	0.1190***	0.127***
	(21.30)	(19.26)	(19.18)	(17.32)
Market Risk Premium	0.0030***	0.0033***	0.0030***	0.0033***
	(25.04)	(23.47)	(17.60)	(16.54)
SMB	-0.0014***	-0.0012***	-0.0014***	-0.0012***
	(-7.97)	(-5.77)	(-7.04)	(-5.19)
HML	0.0022***	0.0024***	0.0022***	0.0024***
	(18.11)	(17.05)	(15.42)	(14.78)
Log (Total Assets)		0.0003		0.0003
		(0.18)		(0.13)
Market to Book		0.0004		0.0004
		(0.16)		(0.16)
Market Leverage		0.0535***		0.0535***
		(3.56)		(3.16)
N	48,674	37,594	48,674	37,594
Adj. R-Squared	0.0450	0.0510	0.0450	0.0510

Table 2.5: IV regression

This table reports IV regression results of the effect of business concentration on bond return. The single flag is first regressed on a group of firm control variables, single = f(firm controls) and the residual is applied to the second regression where the dependent variable is the annualized bond return. Model is estimated with robust standard errors clustered at the firm level. Definitions of the depending and all explanatory variables are summarized in the Appendix. T-statistics are in parentheses. The symbols *, **, *** denote significance at the 10%, 5% and 1% levels, respectively.

Constant	-0.1408**
	(-2.11)
Single	-0.0331*
	(-1.76)
Coupon	0.0013
	(1.03)
Maturity	0.0006***
	(2.85)
Rating	0.0051***
	(7.97)
Age	0.0024***
	(2.97)
Amount Outstanding	-0.0084***
	(-2.64)
Callable	0.0045
	(0.81)
Sinking Fund	-0.0265
	(-1.45)
Trading Volume	-0.0053**
	(-1.32)
Interest Rate	0.0331***
	(12.24)
Slope	0.0624***
	(10.66)
Interest Rate Volatility	-0.0188
	(-1.54)
Default Risk	0.1270***
	(15.71)
Market Risk Premium	0.0032***
	(14.46)
SMB	-0.0015***
	(-5.89)
HML	0.0024***
	(13.63)
N	31,816
Adj. R-squared	0.0490

Table 2.6: Propensity score matching

This table reports propensity score matching results. Panel A reports probit regression results. Estimated probabilities provide "propensity scores" for Panel B. Definitions of the depending and all explanatory variables are summarized in the Appendix. Z-statistics are in parentheses. The symbols *, **, *** denote significance at the 10%, 5% and 1% levels, respectively.

Panel A: Probit	
Log (Sales)	-0.1262***
	(-22.90)
Market to Book	0.2239***
	(15.75)
Market Leverage	0.6752***
	(9.97)
Earnings Volatility	-0.0001***
	(-9.21)
Sales Growth	0.0017
	(0.19)
Free Cash Flow	-3.1151***
	(-25.09)
ROA	2.8302***
	(22.16)
Z-score	-0.0001**
	(-2.35)
Log likelihood	-19919.056
Pseudo R-squared	0.0869
N	32,153

Panel B: Test results for propensity score matching			
	Mean	Difference	T-value
Standalone bonds	0.0842	-0.0075**	-1.90
Control bonds	0.0917		

Table 2.7: The effect of degree of diversification on bond return

This table reports regression results of the effect of degree of diversification on bond returns. The dependent variable is the annualized bond return. Definitions of the depending and all explanatory variables are summarized in the Appendix. Model (1) and (2) are estimated using Huber-White robust standard errors. Model (3) and (4) are estimated using robust standard errors clustered at the firm level. T-statistics are in parentheses. The symbols *, *, ** denote significance at the 10%, 5% and 1% levels, respectively.

	(1)	(2)	(3)	(4)
Constant	-0.1050**	-0.1200*	-0.1050**	-0.1200*
	(-3.03)	(-2.34)	(-2.46)	(-2.10)
# of Segments	0.0020*	0.0027*	0.0020*	0.0027*
	(3.10)	(3.50)	(2.75)	(2.98)
Coupon	0.0011	-0.0007	0.0011	-0.0007
	(1.20)	(-0.60)	(1.06)	(-0.53)
Maturity (years)	0.0007**	0.0006**	0.0007**	0.0006**
	(4.67)	(3.42)	(4.39)	(3.09)
Rating	0.0045**	0.0042**	0.0045**	0.0042**
	(12.48)	(8.33)	(10.38)	(6.16)
Age (years)	0.0018**	0.0024**	0.0018**	0.0024**
	(4.73)	(4.28)	(3.14)	(3.65)
Amount Outstanding	-0.0086**	-0.0092**	-0.0086**	-0.0092**
	(-5.50)	(-3.23)	(-4.37)	(-2.62)
Callable	-0.0008	0.0035	-0.0008	0.0035
	(-0.21)	(0.74)	(-0.21)	(0.67)
Sinking Fund	-0.0160	-0.0195	-0.0160	-0.0195
	(-1.17)	(-1.11)	(-1.17)	(-1.05)
Trading Volume	-0.0066*	-0.0088**	-0.0066*	-0.0088**
	(-2.14)	(-2.63)	(-1.80)	(-2.40)
Control for Market Characteristics?	Y	Y	Y	Y
Control for Firm Characteristics?		Y		Y
N	48,674	37,594	48,674	37,594
Adj. R-Squared	0.0450	0.0510	0.0450	0.0510

Table 2.8: The effect of number of segments on bond return

This table reports regression results of the effect of degree of diversification on bond returns. The dependent variable is the annualized bond return. 2/3/4/5 or above segments is a dummy variable that equals to 1 when a firm only has 2/3/4/5 or above segments. Definitions of the depending and all other explanatory variables are summarized in the Appendix. Model (1) and (2) are estimated using Huber-White robust standard errors. Model (3) and (4) are estimated using robust standard errors clustered at the firm level. T-statistics are in parentheses. The symbols *, *, ** denote significance at the 10%, 5% and 1% levels, respectively.

	(1)	(2)	(3)	(4)
Constant	-0.1070**	-0.1210*	-0.1070*	-0.1210*
	(-3.07)	(-2.34)	(-2.50)	(-2.11)
2 Segments	-0.0088	-0.0134*	-0.0088	-0.0134*
	(-1.57)	(-2.12)	(-1.43)	(-1.92)
3 Segments	0.0103*	0.0096*	0.0103*	0.0096*
	(2.52)	(2.04)	(2.13)	(1.71)
4 Segments	0.0039	0.0066	0.0039	0.0066
	(0.98)	(1.49)	(0.84)	(1.27)
5 Segments or Above	0.0080*	0.0097*	0.0080*	0.0097*
	(1.96)	(2.17)	(1.72)	(1.88)
Coupon	0.0011	-0.0007	0.0011	-0.0007
	(1.20)	(-0.60)	(1.06)	(-0.53)
Maturity (years)	0.0007**	0.0006**	0.0007**	0.0006**
	(4.69)	(3.45)	(4.44)	(3.14)
Rating	0.0044**	0.0041**	0.0044**	0.0041**
	(12.38)	(8.28)	(10.30)	(6.18)
Age (years)	0.0018**	0.0024**	0.0018**	0.0024**
	(4.78)	(4.32)	(3.18)	(3.72)
Amount Outstanding	-0.0084**	-0.0091**	-0.0084**	-0.0091**
	(-5.36)	(-3.19)	(-4.25)	(-2.62)
Callable	-0.0014	0.0032	-0.0014	0.0032
	(-0.34)	(0.67)	(-0.34)	(0.62)
Sinking Fund	-0.0155	-0.0190	-0.0155	-0.0190
	(-1.13)	(-1.08)	(-1.13)	(-1.01)
Trading Volume	-0.0064*	-0.0089**	-0.0064*	-0.0089*
	(-2.08)	(-2.65)	(-1.76)	(-2.43)
Control for Market Characteristics?	Y	Y	Y	Y
Control for Firm Characteristics?		Y		Y
N	48,674	37,594	48,674	37,594
Adj. R-Squared	0.0450	0.0510	0.0450	0.0510

CHAPTER 3: FINANCIAL RESTATEMENT AND THE COST OF DEBT

3.1. Introduction

Accounting restatements is a revision of previously published accounting reports. In the restatement announcement, firms generally disclose revisions of one or more accounting items that affect net income (earnings) and/or operating cash flow. According to the United States General Accounting Office (GAO), the number of accounting restatements have been increasing in recent years: from 919 announcements between January 1997 and June 2002 to 1,390 announcements between July 2002 and September 2005. There are many reasons for restatements, such as reporting fraud, computational errors or failure to apply/misapplication of accounting principles. In general, restatements are viewed as revealing "previously undisclosed, economically meaningful data to market participants" (GAO, 2006).

Previous literature focuses on the impact of earnings restatement events on stockholder wealth and the cost of equity. It has been well documented that earnings restatement results in a significant drop in the firm's market value through two channels. The first channel is a decrease in the expected future cash flows because the restatement of past earnings affect the projections that are based on the originally reported earnings (Palmrose et al., 2004). The second channel involves an increase in the discount rate since a restatement raises the uncertainty and consequently the intrinsic risk of the firm (Hribar and Jenkins, 2004). Besides stockholders, we expect bondholders to be affected

as well since the information conveyed in earnings restatement is relevant for all participants in capital markets. Shi and Zhang (2007) finds that bonds returns on average is negative around the announcements of earnings restatement events.

Compared to the extensive research on earnings restatement, literature on operating cash flow restatements is very limited as there is a widespread belief among analysts and investors that cash flows are more difficult to manipulate than earnings. However, corporate managers have incentives and ability to manipulate operating cash flows. In a recent scandal, Dynegy overstated operating cash flow by $300 million dollars through the use of special transactions. Parmalat, an Italian food company, went further by claiming to have $4.8 billion dollars of cash on its books that was fictitious. With these high-profile scandals, investors start to pay more attention to cash flow statements. Analyst Carol Levenson said "Perhaps it's naïve of me, but I always believed there weren't too many games one could play in the cash flow statement – looks like I was wrong." (Richard 2002, April 29, 2002). Since cash flows are considered as an important factor of credit risk (see Beaver 1966, Ohlson 1980, and DeFond and Hung 2003) and therefore credit ratings (Standard & Poor's, 2008), we posit that restatement of operating cash flows is likely to have a profound effect on the cost of debt capital.[4] Furthermore, interest payments to creditors are generated from operating cash flows, thus restatement events that affect operating cash flows in particular draw great attention from creditors.

In this paper, we investigate the impact of operating cash flow restatements on the cost of debt capital. We use the change in corporate bond yield around the restatement

[4] Journal of Accountancy October 1988 "The Power of the Cash Flow Ratios" "Lenders, rating agencies and Wall Street analysts have long used cash flow ratios to evaluate risk, but auditors have been slow to use them." http://www.journalofaccountancy.com/Issues/1998/Oct/mills.htm JR Mills JH Yamamura

announcement to measure the effect on the cost of debt capital. Since operating cash flow restatements reveal the direction of the change in operating cash flow, which can be positive, negative, or no change (i.e., confirming previous cash flows), we argue that not only the announcement of a restatement affects the cost of debt capital, but also the direction of the resulted change in operating cash flow signals additional new information to debt holders. Furthermore, depending on the type of a restatement (initiator and/or reason of restatements), the impact of restatement on the cost of debt capital could be different. For example, restatements due to accounting fraud will be perceived to have a severe damage to firm creditability than restatements due to misapplication of accounting rules.

Our results provide strong evidence consistent with a reduced cost of debt capital for firms that have announced restatements of operating cash flows. At both transaction and bond levels, we find that bonds yield experiences a significant drop after an operating cash flow restatement. We further decompose the sample based on the direction of change in operating cash flow due to restatements. The results suggest that the reduction in the cost of debt capital is mainly driven by the subsample with previously understated operating cash flows that has been adjusted upward by a restatement. In particular, we find that the drop in bonds yield is significant when restatements introduce an increase in previously understated operating cash flow, but this effect is not significant when restatements lead to a decrease in previously overstated operating cash flow. The same result holds for both the 12- and 6-month event windows. The evidence from the before- and after-restatement yield comparison based on the direction of change in both operating cash flow and net income further confirms that a restatement that increases

previously understated operating cash flow, regardless of its impact on previous net income, leads to a significant decrease in the cost of debt capital. Interestingly, we find that a restatement that decreases previously overstated operating cash flow and net income at the same time leads to a significant increase in bonds yield at transaction level after restatement. However, this evidence is relatively weak due to a small sample size at the bond level.

Furthermore, we examine whether certain bond characteristics affect the direction or magnitude of the yield change associated with the restatements of operating cash flows. We find that the impact of these restatement events is more profound for shorter maturity bonds. Similarly, the effect is significant for noncallable bonds, but not for callable debt. According to Wilson (2008), the information revealed in restatement events exhibit a U-shaped pattern which will no longer be significant beyond the post-restatement period of four quarters on average. By finding that bonds with shorter maturity are affected more by restatements than those with longer maturity, we provide evidence to further support Wilson's argument. In addition, callable debt contains the flexibility for issuers to shorten the maturity, while noncallable debt carries a fixed term of maturity that cannot be altered during the life of the bond. The effect of covenants is interesting yet puzzling: the drop in yield is significant for bonds with less restrictive covenants, while it is insignificant for bonds with more restrictive covenants. Multivariate results confirm the above findings. Positive change in operating cash flow is associated with a significant drop in yield after controlling for bond and firm characteristics, bond market systematic factors, equity market risk factors, and time fixed effects.

Our study contributes to the literature in the following ways. First, this paper examines the restatements of operating cash flow, which has been largely considered to be difficult to manipulate. Until recently, most considered cash flows to be a fact as opposed to a judgment. Our results suggest that there are significant impacts on the cost of debt capital when operating cash flow adjustments are revealed through restatements. Second, to the best of our knowledge, this is the first study on the impact of operating cash flow restatements on a firm's cost of debt capital. The majority of existing study on accounting restatements focuses on the impacts of net income restatements on the cost of equity capital. The fact that debt claims make up a substantial portion of a firm's total capital makes this examination necessary and informative. Moreover, study on cost of equity cannot be generalized freely to study on cost of debt due to the different reaction of debt and equity capital when facing risk (Merton, 1974).

The remainder of study 2 is structured as follows. Section 3.2 discusses the literature review and the hypothesis development. In Section 3.3, we describe the sample data and univariate results. Section 3.4 presents the results of multivariate analysis. Section 2.5 concludes and provides ideas for future research.

3.2. Literature review and hypothesis development

Managers have ways to manage the reporting of cash flows (Lee, 2012). The definition of cash flow under Generally Accepted Accounting Principles (GAAP) is clear, but the classification of cash flows as operating, investing, or financing allows for certain flexibility. For example, managers can decide whether to report investments as available-for-sale, trading securities, or held-to-maturity. When investments are reported as available-for-sale or held-to-maturity, proceeds are classified as cash flow from

investing activities. Yet when investments are reported as trading securities, proceeds are reported as operating cash flows. Thus, by choosing the method of classifying investments, managers have discretion over the reporting of cash flow statements. Another example where managerial discretion influences the reporting of operating cash flows is the capitalization policy. More conservative managers who opt to expense costs are likely to report lower operating cash flows, while managers who choose to capitalize the same costs would report higher operating cash flows and lower investing cash flows. Such activities are not necessarily fraudulent, but tend to occur more often when firms are having difficulty maintaining a desirable level of operating cash flows (Lee, 2012).

On the other hand, managers may choose to violate GAAP when reporting operating cash flows. One example is the aforementioned transaction by Dynegy, which enabled the company to report $300 million in operating cash flows. The case in which Enron misclassified $500 million proceeds from a loan as operating cash flows (instead of financing cash flows) is another. Other companies, such as Worldcom, capitalized $3.8 billion that should have been operating expenses, thus increasing operating cash flows while decreasing investing cash flows. In these cases, managers violated GAAP to report favorable operating cash flows. And auditors often fail to identify (or catch) such violation of GAAP due to their focus on the income statement (Richardson, 2006).

While there is a vast body of literature on the effects of accounting restatements and firms' cost of *equity* capital (Hribar and Jenkins, 2004), a new stream of literature has emerged to examine the effects of accounting restatements on firms' cost of *debt* capital (Shi and Zhang, 2007). Using a sample of 137 bonds of 50 firms that restated their financial statements from 1997 to 2003, Shi and Zhang (2007) document an average

significant and negative excess bond return around the restatement announcements. Our study focuses on operating cash flow restatement and firms' cost of debt capital in particular for the following reasons: first, the fact that debt claims make up a substantial portion of a firm's total capital makes this examination necessary and informative; second, Merton (1974) states that the risk and uncertainty faced by a firm are expected to have opposite effects on equity and debt valuations, which leads to the importance of studying both the cost of debt and cost of equity capital; third, debtholders are more concerned about operating cash flows than net income since the interest payments made to debtholders come from operating cash flows rather than net income. We focus our investigation on the cost of public debt. In the remainder of the section, we put forth the hypotheses for our study. Despite the different implications between operating cash flow and earnings (Graham et al., 2005), they are complementary measures of a firm's performance (Lee, 2012). Thus, we follow some of the findings from the strand of research on earnings restatement when developing our hypotheses on operating cash flow restatement.

Most of the extant literature focuses on either restatements as a whole or more preferably earnings restatements. In one of the earliest studies on the relation between earnings restatements and market returns, Kinney and McDaniel (1989) fail to find a significant change in return within a 6-day window before the restatement announcement. The majority of the subsequent research provides strong evidence that earnings restatement events negatively impact firm value by lowering the expected future free cash flows or increasing the risk of these cash flows. Dechow et al. (1996) examine stock price reaction to public announcements of earnings restatements due to

earnings manipulations identified by the Securities and Exchange Commission for alleged violations of GAAP. They find when the alleged violations are announced to the public, firms are penalized with a significant drop of 9% in stock price. Using a sample of earnings restatement events from 1977 to 2001, Wu (2002) finds that market reacts significantly with -11% cumulative abnormal returns during a three-day window for both the unaudited and audited earnings restatements. In addition, the magnitude of the earnings adjustment has an impact on the size of the loss. Anderson and Yohn (2002) investigate investors' and dealers' perception of the accounting problem revealed in firms' restatements. Using a sample of restatements of audited financial statements announced between 1997 and 1999, they discover a -3.8% decrease in stock price for the seven-day period surrounding the restatement announcement. Palmrose et al. (2004) analyze the 2-day market reaction to restatements announced from 1995 to 1999. They find an abnormal market adjusted return of -9.2% over a 2-day window, which is similar to the finding of Dechow et al. (1996). More negative returns are found when the restatements are associated with multiple accounts, fraudulent charges, or auditor initiations. Hribar and Jenkins's (2004) provide further support that firms' cost of equity increase immediately following a restatement. They also suggest that restatements initiated by auditors are associated with the largest increase in the cost of equity capital. In sum, extant literature shows that restatements result in loss in firm value as evidenced by the stock price reaction. We conjecture that this reputational damage caused by accounting restatements not only impacts the cost of equity capital, but also the capital cost firms face in the debt market.

In addition to examining the market reaction to accounting restatements, prior literature study the effect of restatements on investors' reliance on firms' future financial statements and how the level of information asymmetry changes around the accounting restatements. A handful of measures of information asymmetry have been employed in the literature regarding the impact of restatements on the level of information asymmetry reflected in the stock market. Anderson and Yohn (2002) hypothesize that a restatement announcement will result in an increase in information asymmetry in the stock market, giving investors greater incentives to pursue private information. In particular, they use the bid-ask spread in the stock market as a measure of information asymmetry suggested in Copeland and Galai (1983) and Glosten and Milgrom (1985). They find that the bid-ask spread increases during the seven-day announcement window and the change is more pronounced for the restatements triggered by fraud or revenue recognition problems. Palmrose et al. (2004) document a significant increase in analyst forecast dispersion at the time of the restatement announcement, while analysts provide a significant downward revision in their earnings forecasts following restatements. Graham et al. (2008) provide evidence of an increase in bank loan spread to support the notion that information asymmetry increases following restatements from the lenders' perspectives. Given the above literature, we conjecture that operating cash flow restatements lead to a higher level of information asymmetry as investors are unsure of the accuracy of financial reports.

Hypothesis 1: Operating cash flow restatements indicate a lack of credibility and low-quality of financial statements, raising uncertainty about the firm's earnings quality

and the level of information asymmetry thereby increasing debtholders' required rate of return.

Although accounting restatements involve a correction of one or more accounts in past financial statements, new information that may be previously ignored or deliberately hidden by the management is released to the capital markets by way of the restatement announcement. In a survey paper, Beyer et al. (2010) argue that firms' information environment is developed endogenously given the information asymmetry between capital providers and managers, with the outside investors demanding for accounting information and consequently responding to any new information released. For instance, Datta and Dhillon (1993) provide evidence that the bond market, in addition to the stock market, has a significantly positive (negative) reaction to unexpected earnings increase (decrease). This suggests that the information content in the earnings announcements is well observed by the market participants and the change in security value reflects the nature of the information. Thus, we conjecture that new information is revealed through operating cash flow restatements, leading to investor reaction that is driven by the nature of the information.

Hypothesis 2: As new information is revealed at operating cash flow restatement announcements, the price at which firms pay for raising capital in the debt market will increase (decrease) with a downward (upward) adjustment in operating cash flows.

Previous studies also explore the causes of earnings manipulation. In general, restatement can be due to accounting errors, fraud, non-compliance with GAAP, misrepresentation, or a simple clerical error. In particular, restatement can be initiated by the SEC, an independent auditor, or the company itself. We expect the market to

respond in different ways contingent upon the initiator of the restatements. For example, restatements enforced by the SEC or auditors are more detrimental to the expected value of a firm's future cash flows (Dechow et al. (1996) and Palmrose et al. (2004)). Interestingly, Graham et al. (2008) do not find evidence that the increase in bank loan spread differ across the three types of initiators.

Managers pay a hefty price for earnings manipulation, which may discourage them from engaging in such activities. Desai et al. (2006) find that managers suffer significant reputational penalties of turnover and a subsequent employment with poorer prospects after announcing earnings restatements. Karpoff et al. (2008) provide evidence that managers that are responsible for SEC-initiated financial misrepresentation bear substantial financial losses. A recent paper by Lee (2012) examines the use of cash flow manipulation and identifies the circumstances in which manipulation becomes more likely and the methods by which the manipulation is performed. Not surprisingly, she finds that firms are more likely to engage in misclassification when the incentives to do so are stronger. She identifies that management has strong incentives when firms are in financial distress, have a credit rating at the border between investment and non-investment grades, are followed by analysts who focus on cash flows, or when there is a strong relationship between stock returns and cash flow from operations (CFO). Based on the above discussion, we develop the following hypothesis:

Hypothesis 3: The effect of accounting restatements on the cost of debt capital differ by the type of initiator. Restatements initiated by the SEC or an independent auditor increase a firm's cost of debt capital. Restatements initiated by the company result in a

change in the cost of debt that vary by the nature of the information disclosed in the restatement.

The research closest to our study is Graham et al. (2008). They analyze the impact of financial restatements on debt contracts by examining bank loans. Their financial restatements are those involving accounting irregularities from January 1, 1997 to June 30, 2002. They find that banks use tighter loan contract terms to overcome problems arising from financial restatements. We focus on the pricing of public bonds and examine how it is affected when a firm discloses the misreporting of its financial statements.

3.3. Data

3.3.1. Sample selection

We collect all restatements of the operating cash flows from September, 1989 to February, 2012 from Compustat's Point in Time. This database tracks accounting data monthly in a snapshot format. When an accounting restatement event takes place, adjustments are made to the operating cash flow associated with those quarters affected by this event. We record the month in which the accounting data is revised and regard it as the "restatement month". Since firms are required to file an 8-K report within a short period of time (up to two weeks) if a material change is made to previously-released accounting reports, our methodology of defining the "restatement month" is reasonable and is unlikely to introduce biases. For each restatement event, we record the amount of change in operating cash flow associated with each of the affected quarters. This process yields a sample of 693 restatement events.

We obtain bond issuance and characteristics of public bonds from the Mergent's Fixed Income Securities Database (FISD) database for the period from 1994 to 2012.

Corporate bond pricing data for the sample period are obtained from the National Association of Insurance Commissioners (NAIC) from 1994 through 2013 and the Financial Industry Regulatory Authority's (FINRA)'s TRACE from 2002 through 2013. We also collect bond data from the Lehman Brothers Fixed Income Database, which provides comprehensive information on bond issuance, characteristics, and monthly bid quotes for the earlier part of our sample period from 1989 to 1993. From 1994 to 1998, we match the bonds from Lehman Brothers Fixed Income Database and NAIC by individual bond CUSIP and characteristics to obtain supplemental bond pricing. For bonds with multiple transactions on a given day, we use the market value-weighted price as the price for that day. For each of the restatement event, we require the firm to have outstanding bonds with valid bond price information within one year prior to the restatement or one year after. This requirement yields the final sample of 386 restatement events and 1,438 event-bond observations. We perform the same set of analysis on alternative samples by requiring valid yield information six or three months prior and post restatement and find qualitatively similar results. For brevity, we report the results based on the sample from the requirement of valid pricing information one year prior and one year post restatement.

3.3.2. Sample description and univariate analysis

Table 3.1 presents the summary statistics of our sample. In Panel A, we present the frequency of restatement events over the sample period and find that restatement activities have been increasing over time with the peak occurring in the 2005-2009 period. Although literature has indicated that there is an increasing trend in earnings restatements (see Wilson (2008)), our hand-collected sample yields a limited number of

operating cash flow restatements in the most recent period of 2010 to 2012. Panel B presents the characteristics of bonds issued by the sample firms. Note that some firms (and therefore their outstanding bonds) are associated with more than one restatement events during the sample period. Of the 1,438 event-bond observations, we identify 1,135 unique bonds. The majority of the sample bonds are callable (61.41%), investment-grade (63.7%), and senior (92.68%). 68.63% of the bonds is issued by industrial firms, 28.02% by financial firms, and the remainder of 3.35% by utility firms.

Table 3.2 presents the comparison of bond yield before and after the restatement event. The event window used is one year before and one year after the restatement. We show the comparison at the transaction level in Panel A and at the bond level in Panel B. In each panel, the result is presented at three different winsorization levels: 1%, 2%, and 5%. This comparison is conducted using all available transactions as well as the transactions of those bonds with valid trades in both pre- and post-restatement periods. In Panel A, we observe that the average bond yield decreases significantly after the restatement event. For example, the comparison based on all available transactions using 1% winsorization suggests that the drop in bond yield is 27 basis points around the restatement event, which is significant at the 1% level. The comparison of median bond yield provides further confirmation of a decrease in bond yield after the restatement. In Panel B, we perform the comparison at the bond level using a sub-sample of 936 event-bond observations by requiring each bond to have valid pre- and post-restatement yields. For a given bond, we use four methods to estimate the average bond yield for the pre- or post-restatement period: (1) the simple average of all available yields; (2) the trading volume-weighted average of all available yields; (3) the simple average of quarter-end

yields; and (4) the trading volume-weighted average of quarter-end yields. The result shows that regardless of the methods used, bonds experience a significant drop in yield after the restatement event.

We perform the same analysis using a 6-month window prior and after the restatement event and present the results in Table 3.3. The results in Panel A suggest that the drop in bond yield is significant and the magnitude of the drop is larger than that based on 12-month window. Due to the shorter window, in Panel B the bond level tests are performed based on the methods of the simple average and the trading volume-weighted average. The results suggest strong evidence for a significant drop in bond yield after the restatement and seem to provide evidence against the first hypothesis that restatements lead to an increase in bond yield.

To check whether a restatement event conveys a signal through the direction of the change in operating cash flow, we conduct further tests by dividing the sample based on the direction of change in operating cash flow. We define the change in operating cash flow to be positive (negative) in the following ways. First, if *all* the quarters affected by the restatement event have an understated (overstated) operating cash flow, then the change in operating cash flow is positive (negative). The advantage of this definition is that it reflects a unanimous direction of the change. Second, if more than half of the quarters affected by the restatement event have an understated (overstated) operating cash flow, we define this event to be associated with a positive (negative) change in operating cash flow. Not surprisingly, the results based on the second definition, most likely due to the mixed signs of change, are not as strong as those based on the first definition. For the remainder of the paper, we present results based on the first definition.

In addition, results from Table 3.2 and 3.3 suggest that the results are robust across the two event windows and the averaging methods used in the bond-level analysis. For brevity, we present the results based on the 12-month window and the methods of the trading volume weighted average of all yields and the trading volume weighted average of quarter-end yields.

We present the results of yield comparison by the direction of the change in operating cash flows in Table 3.4. If the restatement reveals a previously understated operating cash flow, a positive adjustment is made to the operating cash flow and the corresponding results are reported in Panel A. On the other hand, if a restatement event gives a negative adjustment to a previously overstated operating cash flow, the results is presented in Panel B. The transaction- and bond-level test shows a positive adjustment in operating cash flow leads to a significant decrease in bond yield, which is statistically and economically significant. For example, the drop in yield on average is 70 basis points based on the bond-level analysis using the trading volume average of all yields and 1% winsorization. Interestingly, there is little or no evidence that a negative adjustment to operating cash flow leads to a significant effect on bond yield. This asymmetrical pattern suggests that the bond market responds to a positive signal embedded in restatements in a strong manner while its reaction to a negative signal is minimal.

In some of the operating cash flow restatements, we observe that there is also an adjustment made to net income or earnings. Therefore, we further partition the sample into four different groups based on the direction of the change in operating cash flow and net income. The results are reported in Table 3.5. Panels A and B suggest that a positive change in operating cash flow, regardless of the change in net income, leads to a

significant decrease in bond yield. This finding is robust at the transaction- and bond levels, across the averaging methods in the bond-level analysis, and across winsorization levels. On the other hand, Panels C suggests that a negative change to operating cash flow and a positive change in net income lead to a significant drop in yield at the transaction level, but the significance disappears at the bond level. Interestingly, Panel D shows at the transaction level an increase in yield (significant at the 1% level) associated with a negative adjustment made to both operating cash flow and net income. The bond level analysis suggests insignificant effects on bond yield probably due to a limited sample size. Based on the results shown in Tables 3.4 and 3.5, we find support for the second hypothesis that the change in bond yield is driven by the nature of information conveyed in the restatement event.

To examine whether the response to accounting restatements is affected by certain bond characteristics, we divide the sample into subsamples based on various bond characteristics and compare the difference in yield changes. In particular, results based on maturity, covenants, and callability are presented in Tables 3.6 through 3.8, respectively.[5] In Table 3.6, we present the results for bonds with maturity longer or equal to ten years in Panel A, and those for bonds with maturity less than ten years in Panel B. At the transaction level, we find that, regardless of the direction of change in operating cash flow, longer maturity bonds show an increase in yield while shorter maturity bonds experience an increase in yield. However, the bond level results indicate that the significant drop in bonds yield remains robust for the shorter maturity bonds when they're facing a positive change in operating cash flow. According to Wilson (2008), the

[5] The definition of covenant categories is available upon request.

information revealed in restatement events exhibit a U-shaped pattern which becomes insignificant after the post-restatement period averaging about four quarters. Thus, our finding that shorter maturity bonds are affected more significantly by the restatement events is consistent with the short-term informational effects of such announcements.

In Table 3.7, we present the yield comparison results based on the number of covenants. We divide the sample based on the median number of bond covenants in the sample. Panel A shows the results for bonds with the number of covenant categories above the median of four. Panel B shows the results for the subsample with the number of covenant categories less or equal to the median. In Panels A.1 and A.2 show that although the change in yield is significant at transaction level, it is hard to make any statistical inference given the insignificant test result at the bond level. On the other hand, the results shown in Panels B.1 and B.2 provide strong evidence that a change in operating cash flow, regardless of the sign, is associated with a decrease in bonds yield after the restatement. The findings suggest that bonds with fewer covenant restrictions react significantly to operating cash flow restatements, whereas bonds with strong covenant protection do not.

In Table 3.8, we present the yield comparison results based on whether the bond is callable. Panel A shows the results for callable bonds, and Panel B presents the findings for the noncallable bonds. Similar to the findings by the number of covenants, the results suggest that only the noncallable bonds respond significantly to the restatement of operating cash flows, and bond yield drops regardless of the direction of the adjustment. The above findings imply that bonds with a shorter maturity, fewer covenants, and no call feature, are more sensitive to restatements.

3.3.3. Multivariate analysis

To further examine the effect of the operating cash flow restatements on the cost of debt, we adopt the following multivariate regression model to test the cross-sectional relation between the change in bond yield and the direction of change in operating cash flow:

$$\begin{aligned} Yield\ Change = {} & \alpha + \beta \times Positive\ OCF\ Change \\ & + \gamma \times Bond\ Characteristics + \delta \times Firm\ Characteristics \\ & + \eta \times Bond\ Market\ Factors + \rho \\ & \times Equity\ Market\ Factors + \varepsilon \end{aligned} \tag{3.1}$$

Yield Change is the difference in bond yield measured in the 12-month period prior to the restatement event and the 12-month period after. Positive OCF Change is a dummy variable that equals to one if a firm has understated operating cash flows (a positive adjustment to OCF after restatement), and zero if a firm has overstated operating cash flows (a negative adjustment to OCF after restatement). For bond characteristics, we include Offering Amount (the natural log of offering amount in dollars), Maturity (time until the bond's maturity in years), Coupon (coupon rate in percentage), Rating (Moody's or S&P rating number with 1 stands for the highest rating Aaa+/AAA), Covenant (the number of covenants), Callable (a dummy variable that equals 1 if the bond is callable, and zero otherwise), Convertible (a dummy variable that equals 1 if the bond if convertible, and zero otherwise). For firm characteristics, we include Book to Market (book value of equity divided by market value of equity), EBIT (EBIT standardized by total assets), Leverage (long-term debt plus current liabilities scaled by total assets), ROA (return on assets, earnings divided by total assets), Size (the natural

log of total assets), Volatility (the standard deviation of quarterly cash flows scaled by the absolute value of the mean of quarterly cash flows over the twelve months prior to the restatement event).

In addition, we control for bond market systematic factors by including Interest Rate (the annual risk-free rate from Kenneth French's website), TERM (the difference between the 10-year and 1-year Treasury constant maturity rates), Interest Rate Volatility (measured by the standard deviation of 3-month Treasury bill rates), and DEF (market credit premium measured by the difference between the Moody's seasoned Baa and Aaa corporate bond yields). We use the Fama-French factors (Market Risk Premium, SMB, and HML) to proxy for the equity market risk factors.

The aforementioned results suggest that bond market participants respond significantly to the restatements of operating cash flow, and the content of the change is an important factor of the change in yield. In other words, we find strong evidence to support the second hypothesis, but not for the first hypothesis. To further explore the second hypothesis in a multivariate framework, we explore whether the direction of change in operating cash flow has a significant impact on the change in yield around restatement events after controlling for a variety of bond-level, firm-level, and market factors. The explanatory variable Positive OCF Change is the variable of interest. Therefore, a negative coefficient on Positive OCF Change is consistent with the second hypothesis that the bond yield of an understated firm decreases because a signal is conveyed by the positive adjustment made to the operating cash flow at the restatement event. The regression are conducted on the event-bond level and the results remain robust across the different averaging methods. For brevity, we present the results based on the

trading volume-weighted average of all yields. The regression results are shown in Table 3.9.

Model 1-3 presents the regression results with the time fixed effects. Notice that the coefficient on Positive OCF Change is negative and significant in model 1, indicating that the bond yield for firms with an understated operating cash flow experiences a significantly larger drop (by 52 basis points) than that for firms with an overstated operating cash flow. This provides support for the second hypothesis that new information is released by the restatement event and the content of the signal is reflected in the cost of debt capital: a lower cost of debt if the operating cash flow is adjusted to be higher. In model 2, we add three interaction variables: Positive OCF Change interacted with maturity, Positive OCF Change interacted with the number of covenants, and Positive OCF Change with callable. We observe that the significance on the Positive OCF Change diminishes and the coefficient on interacted variable of Positive OCF Change and maturity is positive and significant. This finding is consistent with our findings of the univariate analysis: bonds with a longer maturity are less likely to be affected by the signal conveyed in a restatement event. In model 3, we include additional firm-level variables and find similar results as in model 1. In models 4 through 6, we remove the time fixed effects and instead employ controls for bond market systematic factors. In the last three models, we further add controls for the equity market systematic factors. Overall, the regression results across all models provide similar implications. A positive change in operating cash flow indicated in restatement events leads to a significantly larger drop in bond yield.

3.4. Conclusion

Financial misreporting has a profound effect on firm's cost of capital. With the majority of extant literature focusing on earnings restatements, we are the first to study the effect of operating cash flow restatements on a firm's cost of debt capital. We focus on firms with both overstated and understated operating cash flows as revealed through a subsequent restatement.

We find that, although firms with both understated and overstated operating cash flows experience a reduced cost of debt capital after restatements, it's mainly driven by the subsample with previously understated operating cash flows. In particular, firms with understated operating cash flows experience a reduced cost of debt capital after restatements, consistent with the notion that the restatement is a signal of a firm's strong performance and better information. On the other hand, the change in cost of debt with overstated operating cash flow is negative or insignificant, implying support for the signaling effect. We further show that the effect is more profound for bonds with shorter maturity, bonds with fewer covenants, and noncallable bonds. Future work includes collecting data on the initiation of the restatements and conduct tests in regard to the third hypothesis in the paper.

Table 3.1: Summary statistics

This table presents summary statistics for the bonds with valid yield information within (-12 months, +12 months) window of a restatement event. Panel A presents the frequency of restatement events. Panel B presents the summary statistics of the characteristics of the bonds.

Panel A: Restatement Events Frequency		
Year	Frequency	Percentage
1989-1994	45	11.75%
1995-1999	75	19.58%
2000-2004	118	30.81%
2005-2009	133	34.73%
2010-2012	12	3.13%
Total	386	100.00%

Panel B: Bond Characteristics					
	N	Mean	Median	Min	Max
Maturity (years)	1135	12.47	7.00	1.00	100.00
Coupon (%)	1135	6.92	7.00	0.00	14.75
Issue Size (in millions)	1135	372.11	250.00	2.24	5442.08
Number of Covenants	1010	3.92	4.00	0.00	12.00

	N	Percentage
Callable	697	61.41%
Putable	101	8.90%
Convertible	169	14.89%
Sinking Fund	51	4.49%

Issuance Rating		
	N	Percentage
AAA	12	1.06%
AA	121	10.66%
A	379	33.39%
BBB	211	18.59%
High Yield	412	36.30%
Total	1135	100.00%

Industry Category		
	N	Percentage
Industrial	779	68.63%
Financial	318	28.02%
Utility	38	3.35%
Total	1135	100.00%

Seniority		
	N	Percentage
Senior Secured	30	2.64%
Senior	850	74.89%
Senior Subordinate	172	15.15%
Junior Subordinate	4	0.35%
Subordinate	19	1.67%
None	60	5.29%
Total	1135	100.00%

Table 3.2: Pre- and post-restatement yield comparison: 12-month event window

The table presents 12-month pre- and post-restatement yield comparison for the final sample. Panel A presents the results with transaction level data. Panel B presents the results with bond level data, only using those bonds that have yield information both pre- and post-restatements. The symbols *, **, *** denote significance at the 10%, 5% and 1% levels, respectively.

Panel A: Transaction Level						
	All Available Yield			Non-missing Yield For Pre and Post		
	Before (N=59,461)	After (N=62,988)	Yld Change	Before (N=56,577)	After (N=55,532)	Yld Change
1% Winsorization	0.0736	0.0709	-0.0027***	0.0741	0.0728	-0.0013***
2% Winsorization	0.0731	0.0703	-0.0028***	0.0737	0.072	-0.0016***
5% Winsorization	0.0730	0.0704	-0.0026***	0.0740	0.0727	-0.0017***

Panel B: Bond Level, Non-missing Yield for Pre and Post												
	Simple Average			Trading Volume-weighted Average			Simple Average of Quarter-end Yields			Trading Volume-weighted Average of Quarter-end Yields		
	Before (N=936)	After (N=936)	Yld Change	Before (N=815)	After (N=815)	Yld Change	Before (N=936)	After (N=936)	Yld Change	Before (N=815)	After (N=815)	Yld Change
1% Winsorization	0.0739	0.0715	-0.0024	0.0713	0.0670	-0.0043**	0.0735	0.0708	-0.0027	0.0714	0.0676	-0.0038**
2% Winsorization	0.0736	0.0708	-0.0028*	0.0708	0.0665	-0.0043***	0.0735	0.0701	-0.0034**	0.0709	0.0672	-0.0037**
5% Winsorization	0.0726	0.0699	-0.0027**	0.0698	0.0659	-0.0039***	0.0724	0.0688	-0.0036***	0.0699	0.0666	-0.0033**

Table 3.3: Pre- and post-restatement yield comparison: 6-month event window

The table presents 6-month pre- and post-restatement yield comparison for the final sample. Panel A presents the results with transaction level data. Panel B presents the results with bond level data, only using those bonds that have yield information both pre- and post-restatements. The symbols *, **, *** denote significance at the 10%, 5% and 1% levels, respectively.

Panel A: Transaction Level						
	All Available Yield			Non-missing Yield For Pre and Post		
	Before (N=9237)	After (N=9126)	Yld Change	Before (N=9034)	After (N=8498)	Yld Change
1% Winsorization	0.0698	0.0655	-0.0043***	0.0741	0.0728	-0.0032***
2% Winsorization	0.0697	0.0644	-0.0053***	0.0737	0.0720	-0.0045***
5% Winsorization	0.0693	0.0630	-0.0063***	0.0740	0.0727	-0.0055***
Panel B: Bond Level, Non-missing Yield for Pre and Post						
	Simple Average			Trading Volume-weighted Average		
	Before (N=335)	After (N=335)	Yld Change	Before (N=293)	After (N=293)	Yld Change
1% Winsorization	0.0776	0.0721	-0.0055**	0.0755	0.0688	-0.0067**
2% Winsorization	0.0773	0.0722	-0.0051**	0.0747	0.0683	-0.0064***
5% Winsorization	0.0753	0.0712	-0.0041**	0.0729	0.0679	-0.0050***

Table 3.4: Pre- and post-restatement yield comparison by the change in operating cash flow

The table presents pre- and post-restatement yield comparison for subsamples depending on the direction of the change in operating cash flow after the restatements. Panel A presents the results from positive change in operating cash flow with 12-month window pre-and post-restatement. Panel B presents the results from negative change in operating cash flow with 12-month window pre- and post-restatements. The symbols *, **, *** denote significance at the 10%, 5% and 1% levels, respectively.

Panel A: Positive Change in Operating Cash Flow									
	Transaction Level			Bond Level Trading Volume-weighted Avg.			Bond Level Trading Volume-weighted Avg. of Quarter-end Yields		
	Before (N=15,687)	After (N=17,665)	Yld Change	Before (N=321)	After (N=321)	Yld Change	Before (N=321)	After (N=321)	Yld Change
1% Winsorization	0.0698	0.0650	-0.0048***	0.0753	0.0683	-0.0070***	0.0753	0.0688	-0.0065**
2% Winsorization	0.0696	0.0642	-0.0054***	0.0749	0.0681	-0.0068***	0.0748	0.0686	-0.0062***
5% Winsorization	0.0690	0.0630	-0.0060***	0.0734	0.0679	-0.0055***	0.0733	0.0684	-0.0049**
Panel B: Negative Change in Operating Cash Flow									
	Transaction Level			Bond Level Trading Volume-weighted Avg.			Bond Level Trading Volume-weighted Avg. of Quarter-end Yields		
	Before (N=14,390)	After (N=12,546)	Yld Change	Before (N=277)	After (N=277)	Yld Change	Before (N=277)	After (N=277)	Yld Change
1% Winsorization	0.0677	0.0679	0.0002	0.0679	0.0659	-0.0020	0.0684	0.0670	-0.0014
2% Winsorization	0.0670	0.0669	-0.0001	0.0673	0.0646	-0.0027	0.0681	0.0659	-0.0022
5% Winsorization	0.0654	0.0651	-0.0003	0.0661	0.0628	-0.0033	0.0668	0.0642	-0.0026

Table 3.5: Pre- and post-restatement yield comparison by change in operating cash flow and net income

The table presents pre- and post-restatement yield comparison for subsamples depending on the direction of the change in operating cash flow as well as net income after the restatements. The symbols *, **, *** denote significance at the 10%, 5% and 1% levels, respectively.

Panel A: Positive Change in Operating Cash Flow + Positive Change in Net Income									
	Transaction Level			Bond Level Trading Volume-weighted Avg.			Bond Level Trading Volume-weighted Avg. of Quarter-end Yields		
	Before (N=12,941)	After (N=14,395)	Yld Change	Before (N=259)	After (N=259)	Yld Change	Before (N=259)	After (N=259)	Yld Change
1% Winsorization	0.0676	0.0660	-0.0016***	0.0723	0.0668	-0.0055**	0.0720	0.0673	-0.0047*
2% Winsorization	0.0675	0.0638	-0.0037***	0.0721	0.0665	-0.0056**	0.0716	0.0668	-0.0048**
5% Winsorization	0.0672	0.0621	-0.0051***	0.0712	0.0662	-0.0050**	0.0709	0.0665	-0.0044**
Panel B: Positive Change in Operating Cash Flow + Negative Change in Net Income									
	Transaction Level			Bond Level Trading Volume-weighted Avg.			Bond Level Trading Volume-weighted Avg. of Quarter-end Yields		
	Before (N=1,500)	After (N=2,090)	Yld Change	Before (N=30)	After (N=30)	Yld Change	Before (N=30)	After (N=30)	Yld Change
1% Winsorization	0.0994	0.0705	-0.0289***	0.1133	0.0814	-0.0319**	0.1152	0.0815	-0.0337**
2% Winsorization	0.0986	0.0708	-0.0278***	0.1136	0.0814	-0.0322**	0.1152	0.0815	-0.0337**
5% Winsorization	0.097	0.0722	-0.0248***	0.1124	0.0819	-0.0305**	0.1152	0.0817	-0.0335**

Table 3.5 (continued)

Panel C: Negative Change in Operating Cash Flow + Positive Change in Net Income									
	Transaction Level			Bond Level Trading Volume-weighted Avg.			Bond Level Trading Volume-weighted Avg. of Quarter-end Yields		
	Before (N=12,763)	After (N=10,843)	Yld Change	Before (N=224)	After (N=224)	Yld Change	Before (N=224)	After (N=224)	Yld Change
1% Winsorization	0.0661	0.0622	-0.0039***	0.0658	0.0644	-0.0014	0.0663	0.0659	-0.0004
2% Winsorization	0.0648	0.0621	-0.0027***	0.0654	0.063	-0.0024	0.0660	0.0641	-0.0019
5% Winsorization	0.0632	0.0618	-0.0014***	0.0644	0.0609	-0.0035*	0.0650	0.0621	-0.0029
Panel D: Negative Change in Operating Cash Flow + Negative Change in Net Income									
	Transaction Level			Bond Level Trading Volume-weighted Avg.			Bond Level Trading Volume-weighted Avg. of Quarter-end Yields		
	Before (N=815)	After (N=907)	Yld Change	Before (N=40)	After (N=40)	Yld Change	Before (N=40)	After (N=40)	Yld Change
1% Winsorization	0.0536	0.1376	0.0840***	0.0745	0.0771	0.0026	0.0743	0.0715	-0.0028
2% Winsorization	0.0536	0.1367	0.0831***	0.0745	0.0755	0.0010	0.0748	0.0711	-0.0037
5% Winsorization	0.0537	0.1271	0.0734***	0.0731	0.0704	-0.0027	0.0732	0.0699	-0.0033

Table 3.6: Pre- and post-restatement yield comparison by change in operating cash flow and maturity

The table presents 12-month window pre- and post-restatement yield comparison for subsamples depending on the direction of the change in operating cash flow after the restatements. Panel A presents the results with bonds that have maturity equal to or larger than 5 years. Panel B presents the results with bonds that have maturity less than 5 years. The symbols *, **, *** denote significance at the 10%, 5% and 1% levels, respectively.

Panel A: Maturity > 10 years									
Panel A.1: Positive Change in Operating Cash Flow									
	Transaction Level			Bond Level Trading Volume-weighted Avg.			Bond Level Trading Volume-weighted Avg. of Quarter-end Yields		
	Before (N=4,290)	After (N=4,865)	Yld Change	Before (N=104)	After (N=104)	Yld Change	Before (N=104)	After (N=104)	Yld Change
1% Winsorization	0.0609	0.0646	0.0037***	0.0667	0.0651	-0.0016	0.067	0.0656	-0.0014
2% Winsorization	0.0609	0.0644	0.0035***	0.0667	0.0650	-0.0017	0.0669	0.0656	-0.0013
5% Winsorization	0.0607	0.0641	0.0034***	0.0663	0.0649	-0.0014	0.0666	0.0655	-0.0011
Panel A.2: Negative Change in Operating Cash Flow									
	Transaction Level			Bond Level Trading Volume-weighted Avg.			Bond Level Trading Volume-weighted Avg. of Quarter-end Yields		
	Before (N=3,254)	After (N=2,567)	Yld Change	Before (N=67)	After (N=67)	Yld Change	Before (N=67)	After (N=67)	Yld Change
1% Winsorization	0.0602	0.0651	0.0049***	0.0589	0.0570	-0.0019	0.0592	0.0575	-0.0017
2% Winsorization	0.0599	0.0634	0.0035***	0.0588	0.0568	-0.0020	0.0592	0.0573	-0.0019
5% Winsorization	0.0598	0.0625	0.0027***	0.0591	0.0570	-0.0021	0.0593	0.0570	-0.0023

Table 3.6 (continued)

Panel B: Maturity <= 10 years									
Panel B.1: Positive Change in Operating Cash Flow									
	Transaction Level			Bond Level Trading Volume-weighted Avg.			Bond Level Trading Volume-weighted Avg. of Quarter-end Yields		
	Before (N=11,390)	After (N=12,799)	Yld Change	Before (N=217)	After (N=217)	Yld Change	Before (N=217)	After (N=217)	Yld Change
1% Winsorization	0.0730	0.0669	-0.0061***	0.0792	0.0698	-0.0094***	0.0791	0.0703	-0.0088**
2% Winsorization	0.0730	0.0648	-0.0082***	0.0790	0.0699	-0.0091***	0.0788	0.0704	-0.0084**
5% Winsorization	0.0724	0.0630	-0.0094***	0.0779	0.0698	-0.0081***	0.0772	0.0703	-0.0069**
Panel B.2: Negative Change in Operating Cash Flow									
	Transaction Level			Bond Level Trading Volume-weighted Avg.			Bond Level Trading Volume-weighted Avg. of Quarter-end Yields		
	Before (N=11,136)	After (N=9,979)	Yld Change	Before (N=210)	After (N=210)	Yld Change	Before (N=210)	After (N=210)	Yld Change
1% Winsorization	0.0701	0.0686	-0.0015***	0.0708	0.0705	-0.0003	0.0714	0.0701	-0.0013
2% Winsorization	0.0693	0.0680	-0.0013***	0.0708	0.0686	-0.0022	0.0714	0.0697	-0.0017
5% Winsorization	0.0665	0.0658	-0.0007**	0.0693	0.0665	-0.0028	0.0703	0.0683	-0.0020

Table 3.7: Pre- and post-restatement yield comparison by change in operating cash flow and covenants

The table presents 12-month window pre- and post-restatement yield comparison for subsamples depending on the direction of the change in operating cash flow after the restatements. Panel A presents the results of bonds with the number of covenants equal to or bigger than 4. Panel B presents the results of bonds with the number of covenants less than 4. The symbols *, **, *** denote significance at the 10%, 5% and 1% levels, respectively.

Panel A: Number of Covenant Categories > 4									
Panel A.1: Positive Change in Operating Cash Flow									
	Transaction Level			Bond Level Trading Volume-weighted Avg.			Bond Level Trading Volume-weighted Avg. of Quarter-end Yields		
	Before (N=6,989)	After (N=5,875)	Yld Change	Before (N=136)	After (N=136)	Yld Change	Before (N=136)	After (N=136)	Yld Change
1% Winsorization	0.0794	0.1107	0.0313***	0.0874	0.0821	-0.0053	0.087	0.0822	-0.0048
2% Winsorization	0.0792	0.0825	0.0033***	0.0873	0.0825	-0.0048	0.0868	0.0823	-0.0045
5% Winsorization	0.0789	0.0802	0.0013***	0.0858	0.0816	-0.0042	0.0855	0.0816	-0.0039
Panel A.2: Negative Change in Operating Cash Flow									
	Transaction Level			Bond Level Trading Volume-weighted Avg.			Bond Level Trading Volume-weighted Avg. of Quarter-end Yields		
	Before (N=4,692)	After (N=4,485)	Yld Change	Before (N=95)	After (N=95)	Yld Change	Before (N=95)	After (N=95)	Yld Change
1% Winsorization	0.0847	0.0827	-0.0020**	0.0845	0.0930	0.0085	0.085	0.0962	0.0112
2% Winsorization	0.0846	0.0804	-0.0042***	0.0845	0.0912	0.0067	0.0851	0.0897	0.0046
5% Winsorization	0.0832	0.0783	-0.0049***	0.0833	0.0858	0.0025	0.0845	0.0876	0.0031

Table 3.7 (continued)

Panel B: Number of Covenants <= 4									
Panel B.1: Positive Change in Operating Cash Flow									
	Transaction Level			Bond Level Trading Volume-weighted Avg.			Bond Level Trading Volume-weighted Avg. of Quarter-end Yields		
	Before (N=8,698)	After (N=11,790)	Yld Change	Before (N=185)	After (N=185)	Yld Change	Before (N=185)	After (N=185)	Yld Change
1% Winsorization	0.0620	0.0556	-0.0064***	0.0664	0.0583	-0.0081***	0.0665	0.0592	-0.0073**
2% Winsorization	0.0620	0.0553	-0.0067***	0.0660	0.0584	-0.0076***	0.0654	0.0589	-0.0065**
5% Winsorization	0.0615	0.0543	-0.0072***	0.0656	0.0587	-0.0069***	0.0651	0.0595	-0.0056**
Panel B.2: Negative Change in Operating Cash Flow									
	Transaction Level			Bond Level Trading Volume-weighted Avg.			Bond Level Trading Volume-weighted Avg. of Quarter-end Yields		
	Before (N=9,698)	After (N=8,061)	Yld Change	Before (N=182)	After (N=182)	Yld Change	Before (N=182)	After (N=182)	Yld Change
1% Winsorization	0.0592	0.0603	0.0011**	0.0588	0.0539	-0.0049*	0.0591	0.0547	-0.0044
2% Winsorization	0.0574	0.0592	0.0018***	0.0581	0.0529	-0.0052**	0.0586	0.0540	-0.0046*
5% Winsorization	0.0573	0.0591	0.0018***	0.0582	0.0528	-0.0054**	0.0585	0.0537	-0.0048**

Table 3.8: Pre- and post-restatement yield comparison by change in operating cash flow and callability

The table presents 12-month window pre- and post-restatement yield comparison for subsamples depending on the direction of the change in operating cash flow after the restatements. Panel A presents the results for callable bonds. Panel B presents the results for noncallable bonds. The symbols *, **, *** denote significance at the 10%, 5% and 1% levels, respectively.

Panel A: Callable Bonds									
Panel A.1: Positive Change in Operating Cash Flow									
	Transaction Level			Bond Level Trading Volume-weighted Avg.			Bond Level Trading Volume-weighted Avg. of Quarter-end Yields		
	Before (N=10,111)	After (N=9,828)	Yld Change	Before (N=194)	After (N=194)	Yld Change	Before (N=194)	After (N=194)	Yld Change
1% Winsorization	0.0731	0.0841	0.0110***	0.0779	0.0760	-0.0019	0.0779	0.0764	-0.0015
2% Winsorization	0.0728	0.0789	0.0061***	0.0775	0.0758	-0.0017	0.0777	0.0763	-0.0014
5% Winsorization	0.0724	0.0762	0.0038***	0.0763	0.0748	-0.0015	0.0762	0.0749	-0.0013
Panel A.2: Negative Change in Operating Cash Flow									
	Transaction Level			Bond Level Trading Volume-weighted Avg.			Bond Level Trading Volume-weighted Avg. of Quarter-end Yields		
	Before (N=9,325)	After (N=8,442)	Yld Change	Before (N=168)	After (N=168)	Yld Change	Before (N=168)	After (N=168)	Yld Change
1% Winsorization	0.0737	0.0734	-0.0003	0.0726	0.0760	0.0034	0.0729	0.0748	0.0019
2% Winsorization	0.0726	0.0720	-0.0006	0.0726	0.0742	0.0016	0.0730	0.0748	0.0018
5% Winsorization	0.0703	0.0694	-0.0009**	0.0712	0.0720	0.0008	0.0720	0.0728	0.0008

Table 3.8 (continued)

Panel B: Noncallable Bonds									
Panel B.1: Positive Change in Operating Cash Flow									
	Transaction Level			Bond Level Trading Volume-weighted Avg.			Bond Level Trading Volume-weighted Avg. of Quarter-end Yields		
	Before (N=5576)	After (N=7828)	Yld Change	Before (N=127)	After (N=127)	Yld Change	Before (N=127)	After (N=127)	Yld Change
1% Winsorization	0.0638	0.0468	-0.0170***	0.0713	0.0565	-0.0148***	0.0711	0.0574	-0.0137***
2% Winsorization	0.0636	0.0473	-0.0163***	0.0709	0.0566	-0.0143***	0.0704	0.0576	-0.0128***
5% Winsorization	0.0629	0.0475	-0.0154***	0.0682	0.0568	-0.0114***	0.0681	0.0576	-0.0105***
Panel B.2: Negative Change in Operating Cash Flow									
	Transaction Level			Bond Level Trading Volume-weighted Avg.			Bond Level Trading Volume-weighted Avg. of Quarter-end Yields		
	Before (N=5932)	After (N=4925)	Yld Change	Before (N=109)	After (N=109)	Yld Change	Before (N=109)	After (N=109)	Yld Change
1% Winsorization	0.0577	0.0540	-0.0037***	0.0607	0.0521	-0.0086***	0.0612	0.0536	-0.0076**
2% Winsorization	0.0574	0.0541	-0.0033***	0.0600	0.0501	-0.0099***	0.0605	0.0516	-0.0089***
5% Winsorization	0.0572	0.0561	-0.0011***	0.0594	0.0499	-0.0095***	0.0600	0.0513	-0.0087***

Table 3.9: Effects of the restatement of operating cash flow on bonds yield

The table reports regression results on the effect of operating cash flow restatement on bonds yield change. The dependent variable is the change in bonds yield after operating cash flow restatement. Positive OCF Change equals to 1 if operating cash flow is increased after restatement. Robust standard errors are in parentheses. The symbols *, **, *** denote significance at the 10%, 5% and 1% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Constant	1.4020**	1.5590**	1.4367*	0.0057	0.0020	-0.0154	0.0358	0.0332	0.0116
	(0.6561)	(0.6786)	(0.8673)	(0.0217)	(0.0217)	(0.0236)	(0.0239)	(0.0241)	(0.0260)
Positive OCF Change	-0.0052**	-0.0061	-0.0088**	-0.0051**	-0.0054	-0.0077*	-0.0047**	-0.0047	-0.0073*
	(0.0022)	(0.0040)	(0.0042)	(0.0020)	(0.0041)	(0.0044)	(0.0021)	(0.0041)	(0.0043)
Offering Amount	0.0002	0.0004	0.0018	-0.0001	0.0001	0.0018	0.0001	0.0001	0.0017
	(0.0010)	(0.0010)	(0.0013)	(0.0010)	(0.0010)	(0.0012)	(0.0010)	(0.0010)	(0.0012)
Maturity	0.0003***	0.0001	0.0003***	0.0003***	0.0002*	0.0003***	0.0003***	0.0002**	0.0003***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Coupon	0.0004	0.0004	0.0002	0.0006	0.0006	0.0005	0.0006	0.0006	0.0005
	(0.0004)	(0.0005)	(0.0005)	(0.0005)	(0.0005)	(0.0005)	(0.0004)	(0.0005)	(0.0005)
Rating	-0.0003	-0.0002	-0.0003	-0.0003	-0.0003	-0.0003	-0.0003*	-0.0003	-0.0003
	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0002)
Covenant	0.0005	0.0009*	0.0008	0.0003	0.0007	0.0006	0.0005	0.0010*	0.0009
	(0.0004)	(0.0006)	(0.0006)	(0.0003)	(0.0005)	(0.0006)	(0.0003)	(0.0005)	(0.0006)
Callable	0.0108***	0.0101***	0.0061**	0.0099***	0.0096***	0.0048*	0.0104***	0.0097***	0.0051*
	(0.0019)	(0.0027)	(0.0028)	(0.0018)	(0.0026)	(0.0028)	(0.0018)	(0.0026)	(0.0027)
Convertible	-0.0023	-0.0023	-0.0041	-0.0017	-0.0018	-0.0036	-0.0015	-0.0016	-0.0033
	(0.0038)	(0.0039)	(0.0039)	(0.0038)	(0.0039)	(0.0038)	(0.0037)	(0.0038)	(0.0037)
OCF Change × Maturity		0.0004**	0.0003		0.0004**	0.0002		0.0004**	0.0002
		(0.0002)	(0.0002)		(0.0002)	(0.0002)		(0.0002)	(0.0002)
OCF Change × Covenant		-0.0008	-0.0006		-0.0007	-0.0006		-0.0009	-0.0008
		(0.0007)	(0.0007)		(0.0007)	(0.0007)		(0.0007)	(0.0007)
OCF Change × Callable		0.0011	0.004		0.0003	0.0039		0.0009	0.0046
		(0.0040)	(0.0038)		(0.0038)	(0.0038)		(0.0039)	(0.0038)
Book to Market			-0.0015			-0.0011			-0.0016
			(0.002)			(0.0021)			(0.002)
EBIT			0.1176			0.0732			0.0829
			(0.1909)			(0.1937)			(0.1891)

Table 3.9 (continued)

Leverage			-0.0100			-0.0098			-0.0094
			(0.0100)			(0.0092)			(0.0105)
ROA			-0.0390			0.0165			0.0039
			(0.2636)			(0.2670)			(0.2619)
Size			-0.0011			-0.0013*			-0.0014*
			(0.0009)			(0.0008)			(0.0008)
Volatility			-0.0002			-0.0001			-0.0001
			(0.0002)			(0.0002)			(0.0002)
Control for Year Dummies?	Y	Y	Y	N	N	N	N	N	N
Control for Bond Market Characteristics?	N	N	N	Y	Y	Y	Y	Y	Y
Control for Equity Market Characteristics?	N	N	N	N	N	N	Y	Y	Y
N	780	780	754	780	780	754	780	780	754
Adj. R-squared	0.1694	0.1766	0.1901	0.1190	0.1254	0.1443	0.1443	0.1521	0.1654

CHAPTER 4: VOLUNTARY DISCLOSURE AND THE COST OF DEBT

4.1. Introduction

It's commonly viewed by the investing public that corporate managers possess more inside information than outside investors. Thus there's always high demand for financial reporting and disclosure to minimize information asymmetry and agency conflicts between managers and outside investors. Voluntary disclosure is the disclosure of non-mandatory information that a firm's management team chooses to provide. The study of voluntary disclosure is interesting for the following main reasons. First, it shows the extent to which a firm may benefit from disclosure of additional information than those required by regulation. Second, given the flexibility of voluntary disclosure, managers have the incentives to manipulate it to influence the flow of information around certain events (e.g., IPO, share repurchases), which can be accomplished using both the timing and content of voluntary disclosures.

Depending on the type of information released to the public, Meek, Roberts and Gray (1995) classify voluntary disclosures into three major groups: strategic, nonfinancial and financial information. Among these, managerial earnings forecast has drawn the most attention from accounting and finance researchers because earnings is a crucial indicator of a firm's profitability. In this paper, we focus on earnings-related disclosure made by corporate managers.

Although releasing additional information may be costly, firms have several possible motivations to engage in voluntary disclosures. In a theoretical work, Diamond and Verrecchia (1991) suggests that when firms release additional information by voluntary disclosures, they attract a larger base of institutional investors. As a result, the liquidity of the firm's securities increases, resulting in a lower cost of capital. Subsequent empirical work supports this theoretical argument. Firms issuing management earnings forecasts are in greater needs of external financing and are more likely to finance externally in the subsequent months after the voluntary disclosure (see Ruland et al. (1990) and Frankel et al. (1995)). Moreover, Frankel et al. (1995) provides evidence that although issuing earnings forecasts favorably affects the terms at which a firm may be able to raise capital, there's competing forces such as litigation costs and reputation costs which deter managers from doing so. However, their sample is limited to a sample of equity offerings during the period from 1980 to 1984.

Given the fact that debt market is an important market where firms seek capital besides the equity market, it is important to extend the investigation of voluntarily disclosures of earnings estimates to a firm's cost of debt. If new information about future expected cash flows is released to the market through managerial earnings forecasts, bondholders should respond to this information accordingly. We expect bond market to act in the same way as equity market if the level of expected cash flow is to be affected. In particular, the cost of debt capital is reduced if an increase in cash flow is expected, and the cost of debt capital is increased if a drop in cash flow is expected. In the meantime, we expect bond market to act in the opposite way if the risk of expected cash flow is to be affected since bondholders and shareholders hold different opinions from

their risk perspectives. In particular, the cost of debt capital is reduced if the volatility of expected cash flow increases, and the cost of debt capital is increased if the volatility of expected cash flow decreases. Furthermore, if it's shown that managerial earnings forecast has an impact on the bond market and managers are aware of it, then managers would have the incentive to take advantage of this to manipulate investor's decisions, e.g. managers release positive information voluntarily before issuing new bonds so that the firm can enjoy a lower cost of raising capital .

In this paper, we investigate the impact of managerial earnings forecast on the cost of debt capital. We start with a sample of managerial earnings forecast data from First Call Historical Database (FCHD) from August, 1990 to June, 2011. We then examine the change in corporate bond yield around the earnings forecast announcement to measure the effect on the cost of debt capital. For the main results, we use [-3 month, +3 month] window and compare the 3-month average bond yield before and after the announcement date. We find a significant drop in bond yield for the overall sample. For robustness, we also looked at [-2, +2], [-4, +4], [-5, +5] and [-6, +6] window and the results remain the same.

Furthermore, depending on the direction of information released in the managerial earnings forecast (positive or negative surprise), our results shows opposite impact on the cost of debt capital. In particular, when the managerial earnings forecast is a positive surprise, there is an average of 15 to 20 basis points drop in bond yield. On the other hand, when the managerial earnings forecast qualifies as a negative surprise, bond yield increases by 18 to 23 basis points on average. Given that the median issue size of the bonds in our sample is $250 million, the above finding indicates a significant economic

impact of voluntary disclosures on bondholder wealth. Our results provide evidence that the debt market reacts in a timely manner to the information in managerial earnings forecasts provided by the managers by way of voluntary disclosures. We find little evidence that the risk of the firm is significantly affected by the surprises in these earnings forecasts.

We also perform multivariate tests on how voluntary disclosures affect bond yield after controlling for major bond characteristics, firm characteristics, and bond and equity market systematics factors. Announcements of earnings forecast with a positive surprise lead to a drop in bond yield by 1% more than those with a negative surprise. The results from our multivariate regressions confirm that any additional information included in managerial earnings forecast is absorbed by the credit market efficiently. We also provides evidence that bonds with speculative grade, a shorter maturity, or fewer covenants are more sensitive to the voluntary disclosures of managerial earnings forecasts.

The paper is structured as follows. Section 4.2 is the literature review and develops the hypotheses to be tested. Section 4.3 describes the sample data. Section 4.4 discusses the research methodology and reports the results. Section 4.5 summarizes the conclusions and inferences.

4.2. Literature review and hypothesis development

Voluntary disclosure opens a window for the outside investors to peek into the "secret garden" of the firms for more "inside" information, while the size and the opening schedule of the window is at the will of the firm's management. Past literature generally documents the impact of voluntary financial disclosure. A more recent study, Dhaliwal

et al. (2011), posits that other than voluntary financial disclosure, voluntary nonfinancial disclosure does a similar job in attracting dedicated institutional investors and analyst coverage. As a result, the firm would eventually benefit from a lower cost of equity capital. Despite this, issuing earnings forecasts is still an important channel for managers to convey to investors how they view the firm using their "inside information". Management earnings forecasts are voluntary and managers have considerable discretion on whether and how to provide earnings forecasts.

In general, there're two facets about managerial earnings forecast: the level or frequency of the disclosure and the accuracy or content of the disclosure. The strand of literature on the level or frequency of earnings-related voluntary disclosure has widely documented how voluntary disclosure reduces information asymmetry between inside managers and outside investors. One of the many, Coller and Yohn (1997) finds a reduction in bid-ask spread providing management earnings forecast, which is a sign of reduced information asymmetry. Besides, managerial earnings forecast has been shown to affect stock prices (Pownall et al. (1993)), analysts' forecasts (Baginski and Hassell (1990), Kim and Song (2014)), etc. As suggested in the review paper, Core (2001) points out that mandated disclosure is generally of lower quality for firms with high growth opportunities, thus some reduction in information asymmetry through voluntary disclosure is optimal for firms with good growth potential. In the meantime, managers issue voluntary disclosures to develop and maintain a reputation for accurate and transparent reporting.

With reduced information asymmetry and more transparent reporting gained through more voluntary disclosure, researchers also investigate how this benefits the firm from

the perspective of cost of capital. One of the earlier literature looking into this matter, Botosan (1997), finds increased voluntary disclosure reduces cost of equity capital for firms with low analyst coverage. Frankel et al. (1995) posit that firms that are in need of external financing are more likely to forecast and make more earnings-related voluntary disclosure. This is consistent with the idea from Ruland et al. (1990) that issuing earnings forecasts favorably affects the terms at which a firm may be able to raise capital. A follow-up extension, Francis et al (2005), further expands it to 34 international countries since different countries have different investor protection levels that could affect the effectiveness of the voluntary disclosure. They find similar results as Frankel et al. (1995) still hold worldwide: firms in industries with greater external financing needs have higher voluntary disclosure levels, and an expanded disclosure policy for these firms leads to a lowest cost of both debt and equity capital. Besides these extant empirical evidence, researchers also investigate into how reduced information asymmetry from voluntary disclosure reduces the firm's cost of capital. The theoretical work presented by Diamond and Verrecchia (1991) suggests one of the channels: enhanced market liquidity. In this paper, they also show that large firms benefit the most out of it through better disclosure. Moreover, Clement et al. (2003) documents that confirming managerial earnings forecasts assures investors thus reduces uncertainty about the firm's future earnings ability and reduces cost of equity capital. However, by contrast, Francis et al. (2008) argues that disclosure is just a proxy for earnings quality, thus the negative relation between voluntary disclosure and the cost of capital disappears or is substantially reduced after controlling for earnings quality. Zhang (2001) also presented a theoretical

framework in which the cost of capital is positively related to more disclosure if the disclosure themselves lead to a more asymmetric information environment.

To sum up, prior literature on voluntary earnings-related disclosure and firms' cost of capital mainly focuses on the cost and benefits of equity holders. Our study here extends the extant literature by asking the question that how voluntary disclosure affects firms' cost of *debt* capital in particular. To the best of our knowledge, we're the first in the literature to directly link the effect of management earnings forecasts to the subsequence changes in the cost of debt capital.

This research is most closely related to Sengupta (1998), which finds that firms with high disclosure quality ratings from financial analysts enjoy lower cost of debt. However, managerial earnings-related voluntary disclosure is not considered in this paper. Based on all the above arguments, we develop our first hypothesis as follows.

Hypothesis 1: Managerial earnings forecast reduces information asymmetry, therefore reduces the cost of debt capital.

As mentioned previously, besides the level and frequency of earnings-related voluntary disclosure, the directional information conveyed in the disclosure events also has many empirical implications. In general, extant literature shows markets react significantly more negatively to bad news compared with an equivalent amount of good news and a few explanations are provided. Skinner (1994) is one amongst the earliest empirical papers investigating into the directional effect by fitting managerial earnings forecast into a signaling framework. This paper posits that the firms voluntarily disclose optimistic news and the firms voluntarily disclose pessimistic news have very different motivations and adopt different strategies in their earnings-related disclosure. On one

hand, managers make optimistic forecasts to distinguish themselves out from their competitors (Lev and Penman (1990)); on the other hand, managers make preemptive pessimistic news disclosure to reduce potential litigation or reputation costs (Skinner (1994)). Furthermore, Skinner (1994) also provides evidence that optimistic news forecasts tend to be more precise in the form of point or range estimates and only introduces moderate increase in stock prices, while pessimistic news forecasts tend to be qualitative statements instead and it would result in large decrease in stock prices.

Another explanation introduced in Kothari et al. (2009a), "good news spreads faster", posits that this asymmetric market reaction to earnings-related voluntary disclosure may not be driven by the information content, but instead, it's due to optimistic news tend to be leaked much earlier than bad news through other channels, thus the stock price already embraces a good portion of the good news before managerial earnings forecast is revealed to the public. On the contrary, pessimistic news tend to be more of a surprise thus market acts more negatively. Moreover, on average, management delays the release of pessimistic news to investors on purpose.

Kothari et al. (2009b) explores mandated corporate disclosures and posits that there's a directional link between disclosure and firms' cost of capital. Kim and Shi (2011) further expands this link to voluntary disclosures and indicates that there's an asymmetric directional effect of voluntary disclosure on the cost of equity capital. While pessimistic voluntary forecasts increases the cost of equity, optimistic voluntary forecasts do not change the cost of equity within the same period. Furthermore, as Kim and Shi (2011) points out, depending on the information content of managerial earnings forecasts, optimistic and pessimistic news have different impacts on the cost of equity

capital. We posits that this asymmetric effect can be extended to the cost of *debt* capital since optimistic news reduces earnings uncertainty and gives upbeat spirit to shareholders as well as bondholders, while pessimistic news increases earnings uncertainty and adds to the bondholders' worries about the security of their expected fixed income.

Additionally, evidence has been provided that negative news has a more profound impact on the stock price because it contains more surprise information (Kothari et al. (2009a)) or more informative (Hutton et al. (2003)) or more credible (Rogers and Stocken (2005)). Based on the above arguments, we presents the following hypothesis.

Hypothesis 2: Optimistic and pessimistic managerial earnings forecasts have different impacts on firms' cost of debt capital. All else equal, the change in bond prices after pessimistic forecasts is larger in absolute value than that of optimistic forecasts.

Furthermore, whether managerial earnings forecast effectively affects the firm value also depends on the accuracy and credibility of these type of reports. In another word, whether managerial earnings forecast is indeed informative and how the investors interpret the information correspondingly, if there's any, raises question about the effectiveness of managerial earnings forecasts. Hutton and Stocken (2009) examines the long-term effect of the accuracy of managerial earnings forecasts. They find stock price is more responsive and reacts more promptly to positive managerial earnings forecasts as long as a forecasting reputation has been built by the firm in prior forecasts. Not only stock prices, but also analyst's sensitivity to the news is affected by the accuracy of the information conveyed in managers' earnings guidance.

Moreover, Hutton et al. (2003) provides evidence that whereas pessimistic news forecasts are always informative but optimistic news forecasts are only informative when accompanied by verifiable forward-looking statements or if they come from managers who have been accurate in the past, e.g. good forecast reputation. Merkley et al. (2013) finds that both optimistic and pessimistic news forecasts are credible even without disaggregation. However, the detailed forecasts of specific income statement further increases the credibility of pessimistic news (higher analysts' sensitivity to managerial earnings forecast), especially under the circumstances when earnings are otherwise more difficult to predict.

From the firm managers' standpoint, they have the incentive to manipulate both the contents of the voluntary disclosure as well as the timing of the disclosure. Brockman et al. (2008) finds that managers voluntarily disclose more pessimistic news in the 1-month period before repurchasing while increase the frequency and magnitude of optimistic news disclosure in the 1-month period following the repurchase, which substantiates that firm management manipulate their voluntary earnings-related forecast given the fact that the asymmetrical reaction of the market to earnings-related voluntary disclosure is proven to be effective.

So, similar to the cases with equity offerings (Frankel et al. (1995)) and share repurchases (Brockman et al. (2008)), if managerial earnings forecasts shed light on the security prices of the firm, bond prices should be affected as well as equity prices. And managers of the firms that are about to issue new bonds have the strongest motivation to manipulate the information within their earnings-related forecast. Thus, we present our third hypothesis.

Hypothesis 3: If Hypothesis 1 and 2 holds, managers timing the new bond issuance with optimistic earnings-related forecasts, and the effectiveness of this strategy is affected by the accuracy of the historical managerial earnings forecast.

4.3. Sample description

We obtain managerial earnings forecast information from the First Call Historical Database (FCHD), 1993-2011. FCHD is acquired by Thomson Reuters in 2011 and the original data is now released through I/B/E/S Guidance. This database tracks managerial earnings forecasts which are reflected on a daily basis, thus makes it possible to estimate the effect of earnings forecasts on bond prices using an event study. It also provides Company Issued Guideline (CIG) with a description of what a guideline means to the market, and compares it to what the consensus estimates are. In particular, it provides whether the managerial earnings forecasts qualifies as a positive surprise or a negative surprise, or does not qualify as a surprise. Overall, we have 88,172 managerial earnings forecasts from 1993 to 2011, where 28,011 forecasts are qualified as positive surprises and 16,606 are qualified as negative surprises. Year 2006 has the largest number of managerial earnings forecasts with 7,602 observations, while year 1993 has the smallest number of managerial earnings forecasts with 53 observations. Noticeably, starting from 2008, there's a significant difference between the number of positive surprise forecasts and negative surprise forecasts, e.g., 5,763 positive versus 118 negative in 2008, 4,672 positive versus 102 negative in 2009, etc. The sample distribution by year is shown in Table 4.1.

We obtain bond issuance and characteristics of public bonds from the Mergent's Fixed Income Securities Database (FISD) database for the period from 1994 to 2012.

Corporate bond pricing data for the sample period are obtained from the National Association of Insurance Commissioners (NAIC) from 1994 through 2011 and the Financial Industry Regulatory Authority's (FINRA)'s TRACE from 2002 through 2011. We also collect bond data from the Lehman Brothers Fixed Income Database, which provides comprehensive information on bond issuance, characteristics, and monthly bid quotes for the earlier part of our sample period from 1993 to 1998. We match the bonds from Lehman Brothers Fixed Income Database and NAIC by individual bond CUSIP and characteristics to obtain supplemental bond pricing. For bonds with multiple transactions on a given day, we use the market value-weighted price as the price for that day.

We then merge managerial earnings forecast information with the bond data we obtained through the way as described above. For each of the managerial earnings forecast event to be included in the final sample, we require the firm to have outstanding bonds with valid bond price information within [-3,+3] window. We also apply different event windows as small as [-2,+2] months, and as large as [-6,+6] months and the general results are robust throughout different window sizes. We choose to present our final results using [-3,+3] months window because it's wide enough to capture the reaction of the bond market to the earnings forecasts and at the same time, it's not too wide to include other market noises into this event study. This requirement yields our final sample of 28,933 managerial earnings forecast events from 1993 to 2011. 10,835 of these release positive surprise information and 4,095 release negative surprise information.

Table 4.2 presents the characteristics of bonds issued by the firms included in the sample described above. Notice that some firms (and therefore their outstanding bonds)

are associated with more than one managerial earnings forecast events during the whole sample period. Of the 28,933 managerial earnings forecast events, we identify 8,512 unique bonds. The majority of the sample bonds are callable (68.4%), investment-grade (65.58%), and senior (78.9%)[6]. 78.14% of the bonds are issued by industrial firms, 16.06% by financial firms, and the remainder 5.8% by utility firms.

4.4. Empirical analysis

4.4.1. Univariate analysis

Table 4.3 presents the univariate comparison of bond yield pre and post the managerial earnings forecast event at the event-transaction level based on three different window sizes: [-2, +2], [-3, +3], and [-6, +6] months[7]. Since there's no significant outliers of the bond yields, we show the results without any winsorization of the bond yields. Panel A shows the pre and post announcement comparison based on the overall sample. Panel B and C shows the pre and post announcement comparison based on positive earnings surprise sample and negative earnings surprise sample separately. In each panel, we present two types of yield comparison. One is based on all available yields, while the other is based on the yield for the bonds that have at least one valid transaction record pre as well as post the managerial earnings forest announcement.

Based on Panel A, we see that there's a drop in bond yield after the announcement, which is significant across different event windows except for the smallest window, [-2, +2] months. So on average, the managerial earnings forecast brings down the cost of debt capital as indicated by bond yield and increases the bond price. To be more specific,

[6] There's no junior bonds in our final sample.
[7] We also performed the analysis based on [-4, +4] and [-5, +5] months window and the results are very similar.

Panel B and Panel C present the comparison results when additional information – "surprises" are included in the managerial earnings forecasts. Announcements with positive surprises decreases the bond yield while announcements with negative surprises increases the bond yield. This results holds across different event windows and the magnitude of increase in bond yield when there's negative surprises is larger than the corresponding decrease in bond yield when there's positive surprises. Our results here indicate that any new information included in managerial earnings forecasts is efficiently absorbed by the market and is reflected on the firm's cost of debt capital accordingly. These lend support to our Hypothesis 1 and 2.

We further perform a similar univariate test at the event-bond level and the results are presented in Table 4.4. We use the bonds within [-3, +3] months as the sample set of bonds for wider windows up to [-6, +6] months. To be included in the sample, we require each bond to have valid pre- and post-announcement yields. For a given bond, we use two methods to get the point estimate of the bond yield for its pre- or post-announcement period: (1) the simple average of all available yields; (2) the trading volume-weighted average of all available yields. As shown in Panel A, at the event-bond level, bonds yield exhibit a significant drop after the managerial earnings forecast announcement. In addition, the result shows that this drop in the cost of debt capital persists regardless of the methods used or the size of the event window. Panel B reports the same comparison for the subsample where managerial earnings forecast brings positive surprises to the market. Noticeably, a significant drop in bond yield takes place. Based on different bond yield pre- and post-announcement point estimate methodology as well as different event window size from [-2, +2], [-3, +3], to [-6, +6] months, on average, there's a 34 basis

points drop in bond yield. This drop in cost of debt capital brings an increase in bond price, with a median-sized bond at $250 million issuing size (refer to Table 1), this translates into $850,000 dollar value. On the other hand, as exhibited in Panel C, managerial earnings forecasts that sends a negative earnings surprise signal to the market increase the cost of debt, which is reflected by an average increase in bond yield at 46.5 basis points. This would be an average loss of $1,162,500 for the bondholders.

4.4.2. Multivariate analysis

To further examine the effect of the surprising information contained in managerial earnings forecast on the cost of debt, we adopt two multivariate regression models to test the cross-sectional relation between the change in bond yield after the managerial voluntary disclosure and the nature of the surprising information voluntarily provided by firm's management, e.g. positive or negative surprises. The two research designs are provided as follows. Design 1 is based on the overall sample and Design 2 is based on the surprising sample. Both models control for year and firm fixed effects.

Design 1:

$$\begin{aligned} Yield\ Change = {} & \alpha + \beta \times Positive \\ & + \gamma \times Negative + \zeta \times Bond\ Characteristics + \delta \\ & \times Firm\ Characteristics + \eta \times Bond\ Market\ Factors + \rho \\ & \times Equity\ Market\ Factors + \varepsilon \end{aligned} \tag{4.1}$$

Design 2:

$$Yield\ Change = \alpha + \gamma \times Negative + \zeta \times Bond\ Characteristics + \delta \times Firm\ Characteristics + \eta \times Bond\ Market\ Factors + \rho \times Equity\ Market\ Factors + \varepsilon \quad (4.2)$$

Yield Change is the difference in bond yield measured within [-3, +3] months window using simple average methodology. Positive/negative is a dummy variable that equals to one if the managerial earnings forecast contains positive/negative surprise information and zero otherwise. For bond characteristics, we include Offering Amount (the natural log of offering amount in dollars), Maturity (time until the bond's maturity in years), Coupon (coupon rate in percentage), Investment Grade (a dummy variable that equals to one if the bond's issue rating is Baa or above and zero otherwise), Covenant (the number of covenant categories[8]), Callable (a dummy variable that equals one if the bond is callable, and zero otherwise), Convertible (a dummy variable that equals one if the bond if convertible, and zero otherwise). For firm characteristics, we include Size (logarithm of market value of assets, where market value of assets is book value of assets plus the difference between the market and book values of equity), Market to Book (ratio of book assets plus the difference between the market and book values of equity to book assets), Market Leverage (the ratio of book value of debt, debt in current liabilities + long-term debt, to market value of total assets), Cash (the ratio of cash and marketable securities to book value of assets), Free Cash Flow (the ratio of operating income before depreciation – interest expense – income tax – capital expenditures to book value of total assets), Sales Growth (annual sales growth), Capital Expenditure (the ratio of capital

[8] The definition of covenant categories is available upon request.

expenditure to book value of total assets), PP&E (the ratio of PP&E to book value of total assets), and ROA (the ratio of operating income before depreciation to book value of total assets). All the continuous bond and firm control variables are winsorized at 1% level as well as the dependent variable, yield change, in order to minimize the effect of outliers in the sample. The summary statistics of the bond and firm characteristics variables after the 1% winsorization is presented in Table 4.5.

In addition, we control for bond market systematic factors by including Interest Rate (the annual risk-free rate from Kenneth French's website), TERM (the difference between the 10-year and 1-year Treasury constant maturity rates), Interest Rate Volatility (measured by the standard deviation of 3-month Treasury bill rates), and DEF (market credit premium measured by the difference between the Moody's seasoned Baa and Aaa corporate bond yields). We use the Fama-French factors (Market Risk Premium, SMB, and HML) to proxy for the equity market risk factors.

Our baseline regression results from design 1 are presented in Table 4.6. Column 1 shows the results only with bond characteristics controls. Column 2 adds firm characteristics controls. Column 3 adds bond market control variables while column 4 adds equity market control variables. Across all 4 different models, the coefficient on positive remains negative and significant at a 1% level while the coefficient on negative remains positive and significant at a 1% level. Sizewise, voluntary disclosures with negative surprises have a larger impact on the cost of debt capital compared to voluntary disclosures with positive surprises. This matches with our previous univariate results: compared to the managerial earnings forecast sample that only contains neutral information with respect to what the market already perceives, positive earnings surprise

information through managerial earnings forecast reduces the cost of debt capital, and negative earnings surprise increases the cost of debt capital.

Our baseline regression results from design 2 are presented in Table 4.7. Similar to Table 4.6, we have four columns that shows the effect of adding extra set of control variables. The coefficient for our negative dummy represents the impact of voluntary disclosure with negative surprises on firm's cost of debt capital compared to the voluntary disclosures with positive surprises. This coefficient remains positive at a 1% significance level for all the four specifications in Table 4.7.

Our regression results presented fully supports Hypothesis 1 and 2 proposed earlier in this paper. Not only do credit holders respond to managerial earnings forecast in general in a favorable way, they also distinguish between optimistic and pessimistic forecasts, with a stronger reaction when pessimistic forecasts are made to the market. This well fits into a strand of existing literature that negative news has a more profound impact since it contains more surprise information (Kothari et al. (2009a)) or more informative (Hutton et al. (2003)) or more credible (Rogers and Stocken (2005)).

4.4.3. Additional analysis

In general, we expect the market reaction to managerial earnings forecasts would be different between the following two groups: one group consists of the firms that provides voluntary disclosures as a corporate routine, and the other group consists of the firms who provides voluntary disclosures only occasionally. So we divided the sample into two according to the median of the total number of announcements that are made by a firm. Those firms who make 50 or more managerial earnings forecasts are categorized as frequent announcers while the rest are categorized as infrequent announcers and

placed in a comparison sample. The results are presented in Table 4.8. Panel A shows the results based on design 1 while Panel B shows the results based on design 2.

In the overall sample regression, Panel A, positive surprises don't have a significant impact on the change of the cost of debt capital for frequent announcers, but negative surprises increase the cost of debt capital significantly (at a 1% significance level). Comparatively, for the infrequent announcers, the debt market responds to both positive and negative surprises in an opposite way: reduction in the cost of debt capital when there's a positive surprise, and increase in the cost of debt capital when there's a negative surprise. And the negative surprises have a more profound impact on bonds' yield change. In Panel B, where we focus on the sample contains surprises, we see that although in both frequent and infrequent announcers sample, negative surprises increases the yield after announcements significantly compared to positive surprises, this impact is bigger for infrequent announcers[9].

In August 2000, Regulation Fair Disclosure (FD) was promulgated by SEC which mandates that all publicly traded companies must disclose material information to all investors at the same time. So we divide our sample into two based on time: one is before 2001 and the other is after 2001. Presumably, the sample before 2001 (pre-FD period) might be contaminated by private earnings guidance. The results are in Table 4.9. We see that our main results are robust for post-FD period instead of pre-FD period, which indicates private earnings guidance released to certain investor groups before the information is made available to all investing public has made the "surprise" information

[9] Wald tests are performed between frequent and infrequent announcers sample and the results show the coefficient on the positive/negative dummies are significantly different across these two subsamples.

in managerial earnings forecast “not surprising”, as a result, the market is not responding to the “new” information at all or not as much.

To examine whether the response to managerial earnings forecast is affected by certain bond characteristics, we divide the sample into subsamples based on bond maturity, ratings and the number of covenant categories separately. In Table 4.10, we divide the sample into two based on the bond maturity median, 10 years. Since any surprising information contained in managerial earnings forecasts is only a short-term shock to all publicly available information at the time of announcements, we would expect the impact to be stronger within the sample with shorter maturity. According to our results, bonds with a shorter maturity are shown to be more severely impacted by any surprising information contained in managerial earnings forecast.

Next, in Table 4.11, we divide the sample based on the issuing rating of the bond into two subsamples. One is investment grade bonds and the other is high yield bonds. The comparison shows high yield bonds are more negatively impacted by the negative surprise information contained in managerial earnings forecast. High yield bonds are associated with higher default risk. Thus, any additional negative surprise information are more likely to hit the high yield bonds harder compared to investment grade bonds which do not carry as much risk.

Additionally, we also expect that when bondholders are protected with more covenants, the shocks brought by the management should not have as much impact as those bonds with less protective covenants. So in Table 4.12, we divide the sample into two based on the number of covenant categories, 4. The findings suggest that bonds with fewer covenant restrictions react significantly to surprising information contained in the

managerial earnings forecasts, whereas bonds with strong covenant protection are not affected by the surprising information as much as their more restrained counterparties.

In conclusion, our above findings imply that bonds with speculative grade, a shorter maturity, or fewer covenants are more sensitive to the voluntary disclosures of managerial earnings forecasts. Additionally, the most profound impact is found on the bonds issued by the firms that don't provide the managerial guidance on a regular basis.

4.5. Conclusion

Voluntary disclosure has a profound effect on firm's cost of capital. In our study, we focus on the effect of managerial earnings forecasts on a firm's cost of debt capital. In general, we find managerial earnings forecasts release new information to the investors which reduces information asymmetry. This is rewarded with a reduced cost of debt capital after the voluntary disclosure.

More importantly, when surprises are included in the managerial earnings forecasts, depending upon the nature of the surprises (positive or negative), bond market reacts differently. On one hand, firms with positive surprises experience a reduced cost of debt capital after the disclosure, while on the other hand, firms with negative surprises experience an increased cost of debt capital.

We further show that the effect is more profound for bonds with shorter maturity and less covenant restrictions. The impact of managerial earnings forecast is minimal when the issuing firm voluntarily provides earnings guidance on a regular basis. Future work includes investigating whether managers are taking advantage of this phenomenon to lower the cost of raising new external capital from the credit market.

Table 4.1: Sample distribution by year

This table presents the sample distribution by year before and after applying a filter that requires valid bond yield information within [-3 months,+3 months] window.

Year	Number of Voluntary Disclosures					
	Overall Sample			Valid Yields Within [-3,+3]		
	All	Positive Surprise	Negative Surprise	All	Positive Surprise	Negative Surprise
1993	53	7	13	7	2	2
1994	231	23	31	43	2	7
1995	961	46	253	177	7	32
1996	1,512	106	570	257	16	72
1997	2,150	178	812	402	36	89
1998	3,469	280	1,282	770	66	245
1999	3,960	290	1,118	903	76	241
2000	3,920	564	1,209	1,020	153	265
2001	7,284	893	2,344	2,012	235	610
2002	7,340	1,115	1,542	2,262	314	411
2003	7,086	904	1,372	2,392	263	430
2004	8,003	1,167	1,487	2,682	378	402
2005	7,260	976	1,421	2,669	315	436
2006	7,602	1,064	1,609	2,654	310	458
2007	6,886	1,897	1,242	2,410	705	331
2008	6,527	5,763	118	2,567	2,423	29
2009	5,318	4,672	102	2,078	1,963	23
2010	5,707	5,336	51	2,372	2,327	10
2011	2,903	2,730	30	1,256	1,244	2
Total	88,172	28,011	16,606	28,933	10,835	4,095

Table 4.2: Bond characteristics

This table presents the summary of the sample bond characteristics. These sample bonds have valid bond yield information within [-3 months,+3 months] window around the voluntary earnings announcement date.

	N	Mean	Median	Min	Max
Maturity (years)	8,512	10.6600	8	0	100
Coupon (%)	8,512	6.3760	6.625	0	16
Issue Size (in millions)	8,512	408.0000	250	0.331	100000
Number of Covenants	8,423	3.7590	4	0	13
Callable	8,512	0.6840	1	0	1
Putable	8,512	0.0838	0	0	1
Covertible	8,512	0.1590	0	0	1
Sinking Fund	8,512	0.0159	0	0	1

Rating at Issuance		
	N	Percentage
AAA	225	2.64%
AA	992	11.65%
A	2,318	27.23%
BBB	2,047	24.05%
High Yield	2,930	34.42%
	8,512	100.00%

Seniority		
	N	Percentage
Senior Secured	192	2.28%
Senior	6,454	76.62%
Senior Subordinate	1,391	16.51%
Junior Subordinate	26	0.31%
Subordinate	206	2.45%
None	154	1.83%
	8,423	100.00%

Industry Category		
	N	Percentage
Industrial	6,651	78.14%
Financial	1,367	16.06%
Utility	494	5.80%
	8,512	100.00%

Table 4.3: Transaction level pre and post-announcement yield comparison

This table presents a comparison between pre and post-announcement bonds yields at the transaction level. Panel A is based on the overall sample. Panel B is based on the sample with positive surprises included in the voluntary disclosure. Panel C is based on the sample with negative surprises included in the voluntary disclosure. The symbols *, **, *** denote significance at the 10%, 5% and 1% levels, respectively.

Panel A: Overall Sample							
All Available Yields				Non-missing Pre and Post			
[-2,+2]				[-2,+2]			
	Before	After	Diff		Before	After	Diff
N	1,622,709	1,665,266	-0.0001	N	1,591,934	1,590,685	-0.0004***
Yield	0.0495	0.0494		Yield	0.0496	0.0492	
[-3,+3]				[-3,+3]			
	Before	After	Diff		Before	After	Diff
N	2,249,667	2,362,992	-0.0002**	N	2,207,600	2,246,994	-0.0006***
Yield	0.0495	0.0493		Yield	0.0497	0.0491	
[-6,+6]				[-6,+6]			
	Before	After	Diff		Before	After	Diff
N	4,070,566	4,519,532	-0.0006***	N	3,967,648	4,206,519	-0.0010***
Yield	0.0497	0.0491		Yield	0.0500	0.0490	

Panel B: Positive Earnings Surprise							
All Available Yields				Non-missing Pre and Post			
[-2,+2]				[-2,+2]			
	Before	After	Diff		Before	After	Diff
N	883,497	896,750	-0.0007***	N	872,344	863,055	-0.011***
Yield	0.0464	0.0457		Yield	0.0467	0.0456	
[-3,+3]				[-3,+3]			
	Before	After	Diff		Before	After	Diff
N	1,226,133	1,271,075	-0.0011**	N	1,208,702	1,214,594	-0.0015***
Yield	0.0467	0.0456		Yield	0.0470	0.0455	
[-6,+6]				[-6,+6]			
	Before	After	Diff		Before	After	Diff
N	2,229,649	2,427,735	-0.0022***	N	2,180,823	2,263,133	-0.0026***
Yield	0.0473	0.0451		Yield	0.0476	0.0450	

Table 4.3 (continued)

Panel C: Negative Earnings Surprise							
All Available Yields				Non-missing Pre and Post			
[-2,+2]				[-2,+2]			
	Before	After	Diff		Before	After	Diff
N	105,812	116,065	0.0032***	N	101,958	108,065	0.0037***
Yield	0.0593	0.0625		Yield	0.0586	0.0623	
[-3,+3]				[-3,+3]			
	Before	After	Diff		Before	After	Diff
N	147,132	164,855	0.0020**	N	142,579	153,905	0.0022***
Yield	0.0590	0.0610		Yield	0.0586	0.0608	
[-6,+6]				[-6,+6]			
	Before	After	Diff		Before	After	Diff
N	264,174	314,137	0.0029***	N	255,406	290,193	0.0033***
Yield	0.0586	0.0615		Yield	0.0585	0.0618	

Table 4.4: Bond level pre and post-announcement yield comparison

This table presents a comparison between pre and post-announcement bonds yields at the bond level. We require each bond to have at least one valid yield observation both pre and post announcement. Panel A is based on the overall sample. Panel B is based on the sample with positive surprises included in the voluntary disclosure. Panel C is based on the sample with negative surprises included in the voluntary disclosure. The symbols *, **, *** denote significance at the 10%, 5% and 1% levels, respectively.

Panel A: Overall Sample							
Simple Average				Trading Volume-Weighted Average			
[-2,+2]				[-2,+2]			
	Before	After	Diff		Before	After	Diff
N	78,238	78,238	-0.0014	N	77,762	77,762	-0.0012*
Yield	0.0552	0.0538		Yield	0.055	0.0538	
[-3,+3]				[-3,+3]			
	Before	After	Diff		Before	After	Diff
N	83,306	83,306	-0.0015*	N	82,895	82,895	-0.0013*
Yield	0.0559	0.0544		Yield	0.0557	0.0544	
[-6,+6]				[-6,+6]			
	Before	After	Diff		Before	After	Diff
N	90,753	90,753	-0.0019**	N	90,470	90,470	-0.0021***
Yield	0.0568	0.0549		Yield	0.0566	0.0545	

Panel B: Positive Earnings Surprise							
Simple Average				Trading Volume-Weighted Average			
[-2,+2]				[-2,+2]			
	Before	After	Diff		Before	After	Diff
N	33,882	33,882	-0.0027***	N	33,833	33,833	-0.0028***
Yield	0.0514	0.0487		Yield	0.0513	0.0485	
[-3,+3]				[-3,+3]			
	Before	After	Diff		Before	After	Diff
N	35,058	35,058	-0.0032***	N	35,017	35,017	-0.0036***
Yield	0.0519	0.0487		Yield	0.0519	0.0483	
[-6,+6]				[-6,+6]			
	Before	After	Diff		Before	After	Diff
N	36,802	36,802	-0.0039***	N	36,774	36,774	-0.0043***
Yield	0.0525	0.0486		Yield	0.0522	0.0479	

Table 4.4 (continued)

Panel C: Negative Earnings Surprise							
Simple Average				Trading Volume-Weighted Average			
[-2,+2]				[-2,+2]			
	Before	After	Diff		Before	After	Diff
N	8,091	8,091	0.0053**	N	7,993	7,993	0.0048**
Yield	0.0647	0.07		Yield	0.0644	0.0692	
[-3,+3]				[-3,+3]			
	Before	After	Diff		Before	After	Diff
N	9,056	9,056	0.0042*	N	8,974	8,974	0.0039**
Yield	0.0653	0.0695		Yield	0.0651	0.069	
[-6,+6]				[-6,+6]			
	Before	After	Diff		Before	After	Diff
N	10,457	10,457	0.0048**	N	10,396	10,396	0.0049**
Yield	0.066	0.0708		Yield	0.0659	0.0708	

Table 4.5: Descriptive statistics for firm characteristics

This table presents the descriptive statistics for firm characteristics. The sample is based on [-3 months, +3 months] announcement window and simple average method is used to estimate bond yields pre and post announcement. All continuous variables are winsorized at 1% level. Definitions of the depending and all explanatory variables are summarized in the Appendix.

	N	Mean	Median	Std. Dev.	Min	Max
Offering Amount	83,306	19.6400	19.5200	0.6930	18.1300	21.5300
Maturity	83,306	13.1800	10.0000	9.5270	1.0000	44.0000
Coupon	83,306	6.1710	6.5000	2.0450	0.0000	10.5000
Investment Grade	83,306	0.8130	1.0000	0.3900	0.0000	1.0000
Number of Covenants	82,866	4.2860	4.0000	2.1180	0.0000	10.0000
Callable	83,306	0.7190	1.0000	0.4500	0.0000	1.0000
Convertible	83,306	0.0993	0.0000	0.2990	0.0000	1.0000
Size	75,497	9.9100	9.9810	1.4310	6.4240	12.7300
Market to Book	75,497	1.7610	1.5120	0.8170	0.8890	5.3540
Market Leverage	75,497	0.2050	0.1710	0.1350	0.0153	0.6240
Cash Holding	75,796	0.0832	0.0490	0.0950	0.0011	0.5040
Free Cash Flow	75,795	0.0446	0.0426	0.0526	-0.1260	0.1820
Sales Growth	75,767	0.0987	0.0697	0.2170	-0.3690	1.3010
Capital Expenditure	74,979	0.0463	0.0368	0.0369	0.0000	0.1920
PP&E	74,603	0.2990	0.2360	0.2270	0.0024	0.8970
ROA	74,699	0.1360	0.1330	0.0632	-0.0003	0.3120

Table 4.6: Overall impact of surprises in voluntary disclosure on bond yields

This table presents the regression results of the impact of surprises in voluntary disclosure on bond yields. The sample is based on [-3 months, +3 months] announcement window and simple average method is used to estimate bond yields pre and post announcement. This sample includes voluntary disclosure that doesn't have any surprising information. The dependent variable is the change of bond yields after the announcement. Positive/negative is a dummy variable that equals to 1 if there's positive/negative surprise in the voluntary disclosure, and 0 otherwise. Definitions of the depending and all explanatory variables are summarized in the Appendix. T-statistics are in parentheses and the standard errors are clustered at firm level. The symbols *, **, *** denote significance at the 10%, 5% and 1% levels, respectively.

	(1)	(2)	(3)	(4)
Intercept	0.0030	-0.0140***	-0.0292***	-0.0273***
	(1.2014)	(-2.8216)	(-5.3340)	(-4.3891)
Positive	-0.0010***	-0.0009***	-0.0009***	-0.0009***
	(-3.5392)	(-2.9559)	(-2.9559)	(-2.9559)
Negative	0.0017***	0.0015***	0.0015***	0.0015***
	(6.9889)	(6.5517)	(6.5517)	(6.5517)
Offering Amount	0.0001	0.0001	0.0001	0.0001
	(1.5279)	(1.0332)	(1.0332)	(1.0332)
Maturity	0.0001***	0.0001***	0.0001***	0.0001***
	(6.9351)	(6.6187)	(6.6187)	(6.6187)
Coupon	-0.0001	-0.0001	-0.0001	-0.0001
	(-1.2983)	(-0.1123)	(-0.1123)	(-0.1123)
Investment Grade	0.0013**	0.0009	0.0009	0.0009
	(2.4769)	(1.6020)	(1.6020)	(1.6020)
Number of Covenants	-0.0001**	-0.0001	-0.0001	-0.0001
	(-2.1002)	(-1.6308)	(-1.6308)	(-1.6308)
Callable	0.0004**	0.0004**	0.0004**	0.0004**
	(2.4126)	(2.3228)	(2.3228)	(2.3228)
Convertible	-0.0014**	-0.0014**	-0.0014**	-0.0014**
	(-2.3604)	(-2.1359)	(-2.1359)	(-2.1359)
Size		0.0023***	0.0023***	0.0023***
		(5.1193)	(5.1193)	(5.1193)
Market to Book		-0.0009**	-0.0009**	-0.0009**
		(-2.5720)	(-2.5720)	(-2.5720)
Market Leverage		-0.0128***	-0.0128***	-0.0128***
		(-4.4157)	(-4.4157)	(-4.4157)
Cash Holding		-0.0005	-0.0005	-0.0005
		(-0.2533)	(-0.2533)	(-0.2533)
Free Cash Flow		0.0032	0.0032	0.0032
		(0.4069)	(0.4069)	(0.4069)
Sales Growth		0.0019**	0.0019**	0.0019**
		(2.3076)	(2.3076)	(2.3076)
Capital Expenditure		0.0030	0.0030	0.0030
		(0.2581)	(0.2581)	(0.2581)

Table 4.6 (continued)

PP&E		-0.0010	-0.0010	-0.0010
		(-0.3856)	(-0.3856)	(-0.3856)
ROA		0.0021	0.0021	0.0021
		(0.2849)	(0.2849)	(0.2849)
Interest Rate			-0.0017**	0.0012**
			(-2.4904)	(2.4533)
Default Risk			-0.0068***	-0.0041***
			(-14.8460)	(-13.6374)
Slope			0.0042***	0.0032***
			(4.7827)	(3.2616)
Interest Rate Volatility			0.0246***	0.0071***
			(9.5642)	(7.4013)
Market Risk Premium				-0.0001***
				(-6.4283)
SMB				0.0001
				(1.4142)
HML				0.0002***
				(5.7212)
Year Fixed Effect?	Y	Y	Y	Y
Firm Fixed Effect?	Y	Y	Y	Y
N	82,866	72,646	72,646	72,646
Adj. R-Squared	0.196	0.202	0.202	0.202

Table 4.7: Impact of surprises in voluntary disclosure on bond yields (surprise sample)

This table presents the regression results of the impact of surprises in voluntary disclosure on bond yields. The sample is based on [-3 months, +3 months] announcement window and simple average method is used to estimate bond yields pre and post announcement. The sample also excludes voluntary disclosures that don't include surprising information. The dependent variable is the change of bond yields after the announcement. Negative is a dummy variable that equals to 1 if there's negative surprise in the voluntary disclosure, and 0 otherwise. All continuous variable are winsorized at 1% level. Definitions of the depending and all explanatory variables are summarized in the Appendix. T-statistics are in parentheses and the standard errors are clustered at firm level. The symbols *, **, *** denote significance at the 10%, 5% and 1% levels, respectively.

	(1)	(2)	(3)	(4)
Intercept	0.0001	-0.0177***	-0.0329***	-0.0373***
	(0.0021)	(-2.5962)	(-4.4460)	(-4.6237)
Negative	0.0029***	0.0025***	0.0025***	0.0025***
	(7.4410)	(6.1878)	(6.1878)	(6.1878)
Offering Amount	0.0003**	0.0003*	0.0003*	0.0003*
	(2.2186)	(1.8697)	(1.8697)	(1.8697)
Maturity	0.0001***	0.0001***	0.0001***	0.0001***
	(9.0579)	(8.7415)	(8.7415)	(8.7415)
Coupon	-0.0001	0.0001	0.0001	0.0001
	(-0.0010)	(0.4791)	(0.4791)	(0.4791)
Investment Grade	0.0010	0.0005	0.0005	0.0005
	(1.4232)	(0.7180)	(0.7180)	(0.7180)
Number of Covenants	-0.0001	-0.0001	-0.0001	-0.0001
	(-1.3468)	(-0.9496)	(-0.9496)	(-0.9496)
Callable	0.0007***	0.0007***	0.0007***	0.0007***
	(2.6808)	(2.9456)	(2.9456)	(2.9456)
Convertible	-0.0010	-0.0012	-0.0012	-0.0012
	(-1.4933)	(-1.5888)	(-1.5888)	(-1.5888)
Size		0.0025***	0.0025***	0.0025***
		(3.9757)	(3.9757)	(3.9757)
Market to Book		-0.0012***	-0.0012***	-0.0012***
		(-2.6834)	(-2.6834)	(-2.6834)
Market Leverage		-0.0150***	-0.0150***	-0.0150***
		(-4.2245)	(-4.2245)	(-4.2245)
Cash Holding		-0.0035	-0.0035	-0.0035
		(-1.2056)	(-1.2056)	(-1.2056)
Free Cash Flow		0.0079	0.0079	0.0079
		(0.7810)	(0.7810)	(0.7810)
Sales Growth		0.0011	0.0011	0.0011
		(1.1320)	(1.1320)	(1.1320)
Capital Expenditure		0.0078	0.0078	0.0078
		(0.4896)	(0.4896)	(0.4896)

Table 4.7 (continued)

PP&E		-0.0020	-0.0020	-0.0020
		(-0.5652)	(-0.5652)	(-0.5652)
ROA		0.0042	0.0042	0.0042
		(0.4804)	(0.4804)	(0.4804)
Interest Rate			-0.0006	0.0017***
			(-1.1608)	(3.3943)
Default Risk			-0.0062***	-0.0040***
			(-13.2426)	(-9.7273)
Slope			0.0034***	0.0049***
			(3.9111)	(6.4470)
Interest Rate Volatility			0.0203***	0.0087***
			(8.9742)	(5.4751)
Market Risk Premium				-0.0001***
				(-3.7935)
SMB				-0.0001
				(-0.7641)
HML				0.0002***
				(7.3765)
Year Fixed Effect?	Y	Y	Y	Y
Firm Fixed Effect?	Y	Y	Y	Y
N	43,948	39,033	39,033	39,033
Adj. R-Squared	0.243	0.244	0.244	0.244

Table 4.8. Frequent announcers vs. infrequent announcers

This table presents the subsample regression results of the impact of surprises in voluntary disclosure on bond yields between frequent announcers and infrequent announcers. The sample is based on [-3 months, +3 months] announcement window and simple average method is used to estimate bond yields pre and post announcement. Firms make 50 or more announcements in the sample are categorized as frequent announcers. Panel A is based on the whole sample while panel B excludes voluntary disclosures that don't include surprising information. The dependent variable is the change of bond yields after the announcement. Positive/negative is a dummy variable that equals to 1 if there's positive/negative surprise in the voluntary disclosure, and 0 otherwise. All continuous variable are winsorized at 1% level. Definitions of the depending and all explanatory variables are summarized in the Appendix. T-statistics are in parentheses and the standard errors are clustered at firm level. The symbols *, **, *** denote significance at the 10%, 5% and 1% levels, respectively.

Panel A: Overall Sample								
	Frequent Announcers				Infrequent Announcers			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Intercept	0.0022	-0.0040	-0.0173***	-0.0133*	0.0028	-0.0247***	-0.0418***	-0.0418***
	(0.6793)	(-0.8170)	(-3.3121)	(-1.9286)	(0.6261)	(-3.1066)	(-4.5384)	(-4.1129)
Positive	-0.0007*	-0.0006	-0.0006	-0.0006	-0.0013***	-0.0011***	-0.0011***	-0.0011***
	(-1.6579)	(-1.4154)	(-1.4154)	(-1.4154)	(-3.4562)	(-2.9709)	(-2.9709)	(-2.9709)
Negative	0.0013***	0.0014***	0.0014***	0.0014***	0.0020***	0.0016***	0.0016***	0.0016***
	(4.1020)	(4.2159)	(4.2159)	(4.2159)	(5.7049)	(4.8890)	(4.8890)	(4.8890)
Offering Amount	0.0002**	0.0002**	0.0002**	0.0002**	0.0002	-0.0001	-0.0001	-0.0001
	(2.0670)	(2.1419)	(2.1419)	(2.1419)	(0.8146)	(-0.0922)	(-0.0922)	(-0.0922)
Maturity	0.0001***	0.0001***	0.0001***	0.0001***	0.0001	0.0001	0.0001	0.0001
	(8.8432)	(8.1140)	(8.1140)	(8.1140)	(1.1999)	(1.5370)	(1.5370)	(1.5370)
Coupon	-0.0002***	-0.0002***	-0.0002***	-0.0002***	0.0001	0.0002***	0.0002***	0.0002***
	(-3.1351)	(-2.9325)	(-2.9325)	(-2.9325)	(1.1543)	(2.9910)	(2.9910)	(2.9910)
Investment Grade	0.0011	0.0013	0.0013	0.0013	0.0014**	0.0003	0.0003	0.0003
	(1.1494)	(1.2636)	(1.2636)	(1.2636)	(2.1962)	(0.5692)	(0.5692)	(0.5692)
Number of Covenants	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001*	-0.0001	-0.0001	-0.0001
	(-1.3578)	(-1.0767)	(-1.0767)	(-1.0767)	(-1.9026)	(-1.3824)	(-1.3824)	(-1.3824)
Callable	0.0001	0.0001	0.0001	0.0001	0.0008***	0.0008***	0.0008***	0.0008***
	(0.0287)	(0.2538)	(0.2538)	(0.2538)	(2.7129)	(2.7891)	(2.7891)	(2.7891)
Convertible	-0.0030***	-0.0033***	-0.0033***	-0.0033***	0.0001	0.0003	0.0003	0.0003
	(-3.3731)	(-3.4413)	(-3.4413)	(-3.4413)	(0.0111)	(0.4248)	(0.4248)	(0.4248)
Firm Characteristics?	N	Y	Y	Y	N	Y	Y	Y
Bond Market Characteristics?	N	N	Y	Y	N	N	Y	Y
Equity Market Characteristics?	N	N	N	Y	N	N	N	Y
Year Fixed Effect?	Y	Y	Y	Y	Y	Y	Y	Y
Firm Fixed Effect?	Y	Y	Y	Y	Y	Y	Y	Y
N	43,395	39,293	39,293	39,293	39,471	33,353	33,353	33,353
Adj. R-Squared	0.162	0.161	0.161	0.161	0.216	0.232	0.232	0.232

Table 4.8 (continued)

Panel B: Surprise Sample								
	Frequent Announcers				Infrequent Announcers			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Intercept	0.0025	-0.0075	-0.0212***	-0.0278***	-0.0036	-0.0288***	-0.0463***	-0.0482***
	(0.6715)	(-1.1512)	(-2.9394)	(-3.4341)	(-0.6745)	(-2.9294)	(-4.0800)	(-3.8442)
Negative	0.0020***	0.0019***	0.0019***	0.0019***	0.0036***	0.0030***	0.0030***	0.0030***
	(3.4759)	(3.1948)	(3.1948)	(3.1948)	(6.9176)	(5.5778)	(5.5778)	(5.5778)
Offering Amount	0.0003*	0.0003	0.0003	0.0003	0.0004	0.0003	0.0003	0.0003
	(1.7570)	(1.5430)	(1.5430)	(1.5430)	(1.5666)	(0.8966)	(0.8966)	(0.8966)
Maturity	0.0001***	0.0001***	0.0001***	0.0001***	0.0001**	0.0001**	0.0001**	0.0001**
	(10.7949)	(10.2070)	(10.2070)	(10.2070)	(2.3182)	(2.3952)	(2.3952)	(2.3952)
Coupon	-0.0002**	-0.0002**	-0.0002**	-0.0002**	0.0002	0.0003**	0.0003**	0.0003**
	(-2.5185)	(-2.5233)	(-2.5233)	(-2.5233)	(1.5212)	(2.3989)	(2.3989)	(2.3989)
Investment Grade	0.0008	0.0009	0.0009	0.0009	0.0009	0.0001	0.0001	0.0001
	(0.7058)	(0.7609)	(0.7609)	(0.7609)	(1.1694)	(0.1408)	(0.1408)	(0.1408)
Number of Covenants	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001
	(-0.6419)	(-0.4713)	(-0.4713)	(-0.4713)	(-1.3238)	(-0.7770)	(-0.7770)	(-0.7770)
Callable	0.0002	0.0003	0.0003	0.0003	0.0011**	0.0011***	0.0011***	0.0011***
	(0.6966)	(1.1219)	(1.1219)	(1.1219)	(2.5408)	(2.7939)	(2.7939)	(2.7939)
Convertible	-0.0024**	-0.0030***	-0.0030***	-0.0030***	0.0002	0.0005	0.0005	0.0005
	(-2.3923)	(-2.7895)	(-2.7895)	(-2.7895)	(0.1638)	(0.5015)	(0.5015)	(0.5015)
Firm Characteristics?	N	Y	Y	Y	N	Y	Y	Y
Bond Market Characteristics?	N	N	Y	Y	N	N	Y	Y
Equity Market Characteristics?	N	N	N	Y	N	N	N	Y
Year Fixed Effect?	Y	Y	Y	Y	Y	Y	Y	Y
Firm Fixed Effect?	Y	Y	Y	Y	Y	Y	Y	Y
N	22,921	20,602	20,602	20,602	21,027	18,431	18,431	18,431
Adj. R-Squared	0.197	0.194	0.194	0.194	0.263	0.274	0.274	0.274

Table 4.9: Pre fair disclosure vs. post fair disclosure

This table presents the subsample regression results of the impact of surprises in voluntary disclosure on bond yields before and after Fair Disclosure (FD) was enforced in 2000. The sample is based on [-3 months, +3 months] announcement window and simple average method is used to estimate bond yields pre and post announcement. Panel A is based on the whole sample while panel B excludes voluntary disclosures that don't include surprising information. The dependent variable is the change of bond yields after the announcement. Positive/negative is a dummy variable that equals to 1 if there's positive/negative surprise in the voluntary disclosure, and 0 otherwise. All continuous variable are winsorized at 1% level. Definitions of the depending and all explanatory variables are summarized in the Appendix. T-statistics are in parentheses and the standard errors are clustered at firm level. The symbols *, **, *** denote significance at the 10%, 5% and 1% levels, respectively.

Panel A: Overall Sample								
	Pre Fair Disclosure (FD)				Post Fair Disclosure (FD)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Intercept	-0.0032	0.0086	-0.0280	0.0159	-0.0043**	-0.0226***	-0.0394***	0.0125**
	(-0.4046)	(0.2593)	(-1.2617)	(0.3435)	(-2.0556)	(-4.3868)	(-6.6877)	(2.1140)
Positive	-0.0006	-0.0003	-0.0003	-0.0003	-0.0010***	-0.0009***	-0.0009***	-0.0009***
	(-0.5861)	(-0.3631)	(-0.3631)	(-0.3631)	(-3.2745)	(-2.9483)	(-2.9483)	(-2.9483)
Negative	0.0016***	0.0017***	0.0017***	0.0017***	0.0015***	0.0014***	0.0014***	0.0014***
	(2.8775)	(3.1381)	(3.1381)	(3.1381)	(5.3555)	(5.0907)	(5.0907)	(5.0907)
Offering Amount	0.0004	0.0004	0.0004	0.0004	0.0001	0.0001	0.0001	0.0001
	(1.2298)	(1.2686)	(1.2686)	(1.2686)	(0.5378)	(0.8328)	(0.8328)	(0.8328)
Maturity	0.0001	0.0001	0.0001	0.0001	0.0001***	0.0001***	0.0001***	0.0001***
	(0.5173)	(0.6965)	(0.6965)	(0.6965)	(6.8011)	(6.4964)	(6.4964)	(6.4964)
Coupon	0.0002	0.0001	0.0001	0.0001	-0.0001	-0.0001	-0.0001	-0.0001
	(0.7719)	(0.5276)	(0.5276)	(0.5276)	(-1.0910)	(-0.1227)	(-0.1227)	(-0.1227)
Investment Grade	0.0003	-0.0003	-0.0003	-0.0003	0.0005	0.0002	0.0002	0.0002
	(0.2437)	(-0.2183)	(-0.2183)	(-0.2183)	(1.1640)	(0.4780)	(0.4780)	(0.4780)
Number of Covenants	0.0001	0.0001	0.0001	0.0001	-0.0001**	-0.0001*	-0.0001*	-0.0001*
	(0.8800)	(0.3404)	(0.3404)	(0.3404)	(-2.1435)	(-1.7947)	(-1.7947)	(-1.7947)
Callable	0.0003	0.0001	0.0001	0.0001	0.0004**	0.0004**	0.0004**	0.0004**
	(0.6600)	(0.2253)	(0.2253)	(0.2253)	(1.9992)	(2.0133)	(2.0133)	(2.0133)
Convertible	0.0061**	0.0056*	0.0056*	0.0056*	-0.0020***	-0.0021***	-0.0021***	-0.0021***
	(2.2362)	(1.8862)	(1.8862)	(1.8862)	(-3.2317)	(-3.1599)	(-3.1599)	(-3.1599)
Firm Characteristics?	N	Y	Y	Y	N	Y	Y	Y
Bond Market Characteristics?	N	N	Y	Y	N	N	Y	Y
Equity Market Characteristics?	N	N	N	Y	N	N	N	Y
Year Fixed Effect?	Y	Y	Y	Y	Y	Y	Y	Y
Firm Fixed Effect?	Y	Y	Y	Y	Y	Y	Y	Y
N	6,819	5,953	5,953	5,953	76,047	66,693	66,693	66,693
Adj. R-Squared	0.326	0.343	0.343	0.343	0.203	0.206	0.206	0.206

Table 4.9 (continued)

Panel B: Surprise Sample								
	Pre Fair Disclosure (FD)				Post Fair Disclosure (FD)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Intercept	-0.0128	0.0484	-0.0018	0.0265	-0.0095***	-0.0259***	-0.0416***	0.0062
	(-0.6985)	(0.8157)	(-0.0416)	(0.3799)	(-3.2819)	(-3.8105)	(-5.4936)	(0.7333)
Negative	0.0017	0.0021	0.0021	0.0021	0.0027***	0.0025***	0.0025***	0.0025***
	(1.0371)	(1.5183)	(1.5183)	(1.5183)	(6.5678)	(5.6347)	(5.6347)	(5.6347)
Offering Amount	0.0007	0.0010	0.0010	0.0010	0.0002	0.0003	0.0003	0.0003
	(0.8870)	(1.1937)	(1.1937)	(1.1937)	(1.6209)	(1.6023)	(1.6023)	(1.6023)
Maturity	-0.0001	-0.0001	-0.0001	-0.0001	0.0001***	0.0001***	0.0001***	0.0001***
	(-0.4716)	(-0.4983)	(-0.4983)	(-0.4983)	(9.1340)	(9.0476)	(9.0476)	(9.0476)
Coupon	0.0007*	0.0006	0.0006	0.0006	-0.0001	0.0001	0.0001	0.0001
	(1.7456)	(1.5131)	(1.5131)	(1.5131)	(-0.0803)	(0.2748)	(0.2748)	(0.2748)
Investment Grade	-0.0008	-0.0011	-0.0011	-0.0011	0.0003	-0.0001	-0.0001	-0.0001
	(-0.2291)	(-0.3129)	(-0.3129)	(-0.3129)	(0.6023)	(-0.0584)	(-0.0584)	(-0.0584)
Number of Covenants	0.0001	0.0001	0.0001	0.0001	-0.0001	-0.0001	-0.0001	-0.0001
	(0.5747)	(0.1750)	(0.1750)	(0.1750)	(-1.1012)	(-0.7530)	(-0.7530)	(-0.7530)
Callable	0.0002	0.0002	0.0002	0.0002	0.0006**	0.0007**	0.0007**	0.0007**
	(0.3240)	(0.2372)	(0.2372)	(0.2372)	(2.2124)	(2.5206)	(2.5206)	(2.5206)
Convertible	0.0117***	0.0107**	0.0107**	0.0107**	-0.0019***	-0.0022***	-0.0022***	-0.0022***
	(2.8110)	(2.3752)	(2.3752)	(2.3752)	(-2.7516)	(-3.0686)	(-3.0686)	(-3.0686)
Firm Characteristics?	N	Y	Y	Y	N	Y	Y	Y
Bond Market Characteristics?	N	N	Y	Y	N	N	Y	Y
Equity Market Characteristics?	N	N	N	Y	N	N	N	Y
Year Fixed Effect?	Y	Y	Y	Y	Y	Y	Y	Y
Firm Fixed Effect?	Y	Y	Y	Y	Y	Y	Y	Y
N	2,362	2,085	2,085	2,085	41,586	36,948	36,948	36,948
Adj. R-Squared	0.414	0.447	0.447	0.447	0.242	0.242	0.242	0.242

Table 4.10: Longer maturity vs. shorter maturity

This table presents a comparison of the subsample regression results of the impact of surprises in voluntary disclosure on bond yields between bonds that have longer maturity and those with shorter maturity (based on sample median, 10 years). The sample is based on [-3 months, +3 months] announcement window and simple average method is used to estimate bond yields pre and post announcement. Panel A is based on the whole sample while panel B excludes voluntary disclosures that don't include surprising information. The dependent variable is the change of bond yields after the announcement. Positive/negative is a dummy variable that equals to 1 if there's positive/negative surprise in the voluntary disclosure, and 0 otherwise. All continuous variable are winsorized at 1% level. Definitions of the depending and all explanatory variables are summarized in the Appendix. T-statistics are in parentheses and the standard errors are clustered at firm level. The symbols *, **, *** denote significance at the 10%, 5% and 1% levels, respectively.

Panel A: Overall Sample								
	Maturity >= 10 Years				Maturity < 10 Years			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Intercept	0.0008	-0.0104**	-0.0232***	-0.0227***	0.0032	-0.0194**	-0.0387***	-0.0331***
	(0.3351)	(-2.5730)	(-5.0076)	(-3.5369)	(0.6501)	(-2.2228)	(-3.7612)	(-3.1645)
Positive	-0.0005*	-0.0004	-0.0004	-0.0004	-0.0016***	-0.0015***	-0.0015***	-0.0015***
	(-1.7593)	(-1.3922)	(-1.3922)	(-1.3922)	(-4.2860)	(-3.6896)	(-3.6896)	(-3.6896)
Negative	0.0012***	0.0011***	0.0011***	0.0011***	0.0022***	0.0018***	0.0018***	0.0018***
	(5.0088)	(4.8763)	(4.8763)	(4.8763)	(6.2561)	(5.1421)	(5.1421)	(5.1421)
Offering Amount	0.0001**	0.0001*	0.0001*	0.0001*	0.0003	0.0001	0.0001	0.0001
	(2.0500)	(1.8983)	(1.8983)	(1.8983)	(1.0879)	(0.2339)	(0.2339)	(0.2339)
Maturity	0.0001***	0.0001***	0.0001***	0.0001***	0.0002***	0.0002***	0.0002***	0.0002***
	(8.4789)	(7.7820)	(7.7820)	(7.7820)	(4.1113)	(4.2436)	(4.2436)	(4.2436)
Coupon	0.0001	0.0001	0.0001	0.0001	-0.0002**	-0.0001	-0.0001	-0.0001
	(0.6309)	(1.2858)	(1.2858)	(1.2858)	(-2.3187)	(-0.9038)	(-0.9038)	(-0.9038)
Investment Grade	0.0006	0.0002	0.0002	0.0002	0.0016*	0.0009	0.0009	0.0009
	(1.3585)	(0.5103)	(0.5103)	(0.5103)	(1.8119)	(1.1123)	(1.1123)	(1.1123)
Number of Covenants	-0.0001*	-0.0001*	-0.0001*	-0.0001*	-0.0001**	-0.0001**	-0.0001**	-0.0001**
	(-1.8823)	(-1.7824)	(-1.7824)	(-1.7824)	(-2.4264)	(-2.1849)	(-2.1849)	(-2.1849)
Callable	-0.0001	-0.0001	-0.0001	-0.0001	0.0009***	0.0009***	0.0009***	0.0009***
	(-0.3464)	(-0.3958)	(-0.3958)	(-0.3958)	(2.9095)	(2.9493)	(2.9493)	(2.9493)
Convertible	-0.0001	0.0001	0.0001	0.0001	-0.0025*	-0.0030*	-0.0030*	-0.0030*
	(-0.0857)	(0.1465)	(0.1465)	(0.1465)	(-1.8098)	(-1.7598)	(-1.7598)	(-1.7598)
Firm Characteristics?	N	Y	Y	Y	N	Y	Y	Y
Bond Market Characteristics?	N	N	Y	Y	N	N	Y	Y
Equity Market Characteristics?	N	N	N	Y	N	N	N	Y
Year Fixed Effect?	Y	Y	Y	Y	Y	Y	Y	Y
Firm Fixed Effect?	Y	Y	Y	Y	Y	Y	Y	Y
N	47,107	42,211	42,211	42,211	35,759	30,435	30,435	30,435
Adj. R-Squared	0.203	0.205	0.205	0.205	0.208	0.218	0.218	0.218

Table 4.10 (continued)

Panel B: Surprise Sample								
	Maturity >= 10 Years				Maturity < 10 Years			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Intercept	0.0033	-0.0156**	-0.0289***	-0.0350***	-0.0058	-0.0220*	-0.0423***	-0.0433***
	(1.2496)	(-2.5216)	(-4.2932)	(-4.8310)	(-0.7696)	(-1.7898)	(-3.0090)	(-2.9263)
Negative	0.0019***	0.0017***	0.0017***	0.0017***	0.0040***	0.0035***	0.0035***	0.0035***
	(5.3389)	(4.5392)	(4.5392)	(4.5392)	(7.3204)	(5.8815)	(5.8815)	(5.8815)
Offering Amount	0.0002*	0.0003**	0.0003**	0.0003**	0.0007*	0.0005	0.0005	0.0005
	(1.9197)	(2.1793)	(2.1793)	(2.1793)	(1.7812)	(1.1588)	(1.1588)	(1.1588)
Maturity	0.0001***	0.0001***	0.0001***	0.0001***	0.0002***	0.0003***	0.0003***	0.0003***
	(9.6822)	(9.2695)	(9.2695)	(9.2695)	(3.2643)	(3.4337)	(3.4337)	(3.4337)
Coupon	0.0001	0.0001	0.0001	0.0001	-0.0002	-0.0001	-0.0001	-0.0001
	(0.2976)	(0.5865)	(0.5865)	(0.5865)	(-1.4060)	(-0.9142)	(-0.9142)	(-0.9142)
Investment Grade	0.0001	-0.0001	-0.0001	-0.0001	0.0013	0.0006	0.0006	0.0006
	(0.2401)	(-0.1573)	(-0.1573)	(-0.1573)	(1.1332)	(0.4993)	(0.4993)	(0.4993)
Number of Covenants	-0.0001	-0.0001	-0.0001	-0.0001	-0.0002*	-0.0001	-0.0001	-0.0001
	(-1.2164)	(-1.5306)	(-1.5306)	(-1.5306)	(-1.7693)	(-1.4766)	(-1.4766)	(-1.4766)
Callable	0.0001	0.0001	0.0001	0.0001	0.0016***	0.0016***	0.0016***	0.0016***
	(0.3363)	(0.2313)	(0.2313)	(0.2313)	(3.0476)	(3.2246)	(3.2246)	(3.2246)
Convertible	0.0002	0.0002	0.0002	0.0002	-0.0023	-0.0030	-0.0030	-0.0030
	(0.3929)	(0.3176)	(0.3176)	(0.3176)	(-1.3855)	(-1.5989)	(-1.5989)	(-1.5989)
Firm Characteristics?	N	Y	Y	Y	N	Y	Y	Y
Bond Market Characteristics?	N	N	Y	Y	N	N	Y	Y
Equity Market Characteristics?	N	N	N	Y	N	N	N	Y
Year Fixed Effect?	Y	Y	Y	Y	Y	Y	Y	Y
Firm Fixed Effect?	Y	Y	Y	Y	Y	Y	Y	Y
N	26,521	23,858	23,858	23,858	17,427	15,175	15,175	15,175
Adj. R-Squared	0.245	0.240	0.240	0.240	0.249	0.255	0.255	0.255

Table 4.11: Investment grade vs. high yield

This table presents a comparison of the subsample regression results of the impact of surprises in voluntary disclosure on bond yields between investment grade bonds and high yield bonds. The sample is based on [-3 months, +3 months] announcement window and simple average method is used to estimate bond yields pre and post announcement. Panel A is based on the whole sample while panel B excludes voluntary disclosures that don't include surprising information. The dependent variable is the change of bond yields after the announcement. Positive/negative is a dummy variable that equals to 1 if there's positive/negative surprise in the voluntary disclosure, and 0 otherwise. All continuous variable are winsorized at 1% level. Definitions of the depending and all explanatory variables are summarized in the Appendix. T-statistics are in parentheses and the standard errors are clustered at firm level. The symbols *, **, *** denote significance at the 10%, 5% and 1% levels, respectively.

Panel A: Overall Sample								
	Investment Grade Bonds				High Yield Bonds			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Intercept	0.0049**	-0.0098**	-0.0232***	-0.0183***	-0.0005	-0.0143	-0.0391**	-0.0481***
	(2.3170)	(-2.1360)	(-4.4127)	(-2.9501)	(-0.0440)	(-1.1351)	(-2.3865)	(-2.9537)
Positive	-0.0011***	-0.0009**	-0.0009**	-0.0009**	-0.0009*	-0.0010*	-0.0010*	-0.0010*
	(-3.0445)	(-2.5258)	(-2.5258)	(-2.5258)	(-1.9156)	(-1.8975)	(-1.8975)	(-1.8975)
Negative	0.0013***	0.0011***	0.0011***	0.0011***	0.0030***	0.0028***	0.0028***	0.0028***
	(4.8963)	(4.5551)	(4.5551)	(4.5551)	(5.7555)	(4.9051)	(4.9051)	(4.9051)
Offering Amount	0.0001	0.0001	0.0001	0.0001	0.0004	0.0003	0.0003	0.0003
	(1.3800)	(0.3277)	(0.3277)	(0.3277)	(0.6810)	(0.5869)	(0.5869)	(0.5869)
Maturity	0.0001***	0.0001***	0.0001***	0.0001***	0.0001	0.0001	0.0001	0.0001
	(7.7404)	(7.2244)	(7.2244)	(7.2244)	(0.6110)	(1.5313)	(1.5313)	(1.5313)
Coupon	-0.0001	-0.0001	-0.0001	-0.0001	0.0001	0.0003	0.0003	0.0003
	(-1.2842)	(-0.5786)	(-0.5786)	(-0.5786)	(0.1298)	(1.5898)	(1.5898)	(1.5898)
Number of Covenants	-0.0001**	-0.0001	-0.0001	-0.0001	-0.0001*	-0.0001*	-0.0001*	-0.0001*
	(-2.2052)	(-1.5158)	(-1.5158)	(-1.5158)	(-1.8538)	(-1.8914)	(-1.8914)	(-1.8914)
Callable	0.0001	0.0001	0.0001	0.0001	0.0020**	0.0018**	0.0018**	0.0018**
	(0.5736)	(0.4919)	(0.4919)	(0.4919)	(2.2166)	(1.9757)	(1.9757)	(1.9757)
Convertible	-0.0008	-0.0006	-0.0006	-0.0006	-0.0008	-0.0008	-0.0008	-0.0008
	(-1.4019)	(-0.9664)	(-0.9664)	(-0.9664)	(-0.7230)	(-0.7360)	(-0.7360)	(-0.7360)
Firm Characteristics?	N	Y	Y	Y	N	Y	Y	Y
Bond Market Characteristics?	N	N	Y	Y	N	N	Y	Y
Equity Market Characteristics?	N	N	N	Y	N	N	N	Y
Year Fixed Effect?	Y	Y	Y	Y	Y	Y	Y	Y
Firm Fixed Effect?	Y	Y	Y	Y	Y	Y	Y	Y
N	67,321	59,061	59,061	59,061	15,545	13,585	13,585	13,585
Adj. R-Squared	0.177	0.172	0.172	0.172	0.256	0.279	0.279	0.279

Table 4.11 (continued)

Panel B: Surprise Sample								
	Investment Grade Bonds				High Yield Bonds			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Intercept	0.0033	-0.0123	-0.0257***	-0.0297***	-0.0117	-0.0324**	-0.0551***	-0.0570***
	(1.1240)	(-1.6118)	(-3.1175)	(-3.4786)	(-0.9161)	(-2.1274)	(-2.7677)	(-2.8981)
Negative	0.0024***	0.0020***	0.0020***	0.0020***	0.0043***	0.0040***	0.0040***	0.0040***
	(5.2003)	(4.3188)	(4.3188)	(4.3188)	(6.4794)	(5.7908)	(5.7908)	(5.7908)
Offering Amount	0.0002*	0.0001	0.0001	0.0001	0.0010	0.0009	0.0009	0.0009
	(1.6674)	(1.1078)	(1.1078)	(1.1078)	(1.4696)	(1.2238)	(1.2238)	(1.2238)
Maturity	0.0001***	0.0001***	0.0001***	0.0001***	0.0001	0.0001	0.0001	0.0001
	(9.8825)	(9.4109)	(9.4109)	(9.4109)	(0.1669)	(0.8581)	(0.8581)	(0.8581)
Coupon	0.0001	0.0001	0.0001	0.0001	-0.0001	0.0001	0.0001	0.0001
	(0.5026)	(0.3609)	(0.3609)	(0.3609)	(-0.5240)	(0.4490)	(0.4490)	(0.4490)
Number of Covenants	-0.0001**	-0.0001*	-0.0001*	-0.0001*	-0.0001	-0.0001	-0.0001	-0.0001
	(-2.0545)	(-1.7769)	(-1.7769)	(-1.7769)	(-1.3973)	(-1.4030)	(-1.4030)	(-1.4030)
Callable	0.0004*	0.0003	0.0003	0.0003	0.0018*	0.0019*	0.0019*	0.0019*
	(1.6609)	(1.5683)	(1.5683)	(1.5683)	(1.7268)	(1.7623)	(1.7623)	(1.7623)
Convertible	-0.0003	-0.0002	-0.0002	-0.0002	-0.0010	-0.0014	-0.0014	-0.0014
	(-0.3859)	(-0.1995)	(-0.1995)	(-0.1995)	(-0.7273)	(-0.9206)	(-0.9206)	(-0.9206)
Firm Characteristics?	N	Y	Y	Y	N	Y	Y	Y
Bond Market Characteristics?	N	N	Y	Y	N	N	Y	Y
Equity Market Characteristics?	N	N	N	Y	N	N	N	Y
Year Fixed Effect?	Y	Y	Y	Y	Y	Y	Y	Y
Firm Fixed Effect?	Y	Y	Y	Y	Y	Y	Y	Y
N	35,079	31,201	31,201	31,201	8,869	7,832	7,832	7,832
Adj. R-Squared	0.225	0.213	0.213	0.213	0.283	0.304	0.304	0.304

Table 4.12: More constraints vs. less constraints

This table presents a comparison of the subsample regression results of the impact of surprises in voluntary disclosure on bond yields between bonds that have more covenants and less covenants (based on sample median, 4). The sample is based on [-3 months, +3 months] announcement window and simple average method is used to estimate bond yields pre and post announcement. Panel A is based on the whole sample while panel B excludes voluntary disclosures that don't include surprising information. The dependent variable is the change of bond yields after the announcement. Positive/negative is a dummy variable that equals to 1 if there's positive/negative surprise in the voluntary disclosure, and 0 otherwise. All continuous variable are winsorized at 1% level. Definitions of the depending and all explanatory variables are summarized in the Appendix. T-statistics are in parentheses and the standard errors are clustered at firm level. The symbols *, **, *** denote significance at the 10%, 5% and 1% levels, respectively.

Panel A: Overall Sample								
	# of Covenants >= 4				# of Covenants < 4			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Intercept	0.0024	-0.0151**	-0.0303***	-0.0229***	0.0007	-0.0221**	-0.0348***	-0.0379***
	(0.7409)	(-2.5297)	(-4.8051)	(-3.1908)	(0.1509)	(-2.5814)	(-3.3785)	(-3.3458)
Positive	-0.0007**	-0.0006*	-0.0006*	-0.0006*	-0.0021***	-0.0017***	-0.0017***	-0.0017***
	(-2.1291)	(-1.8981)	(-1.8981)	(-1.8981)	(-4.8601)	(-3.5955)	(-3.5955)	(-3.5955)
Negative	0.0015***	0.0013***	0.0013***	0.0013***	0.0022***	0.0023***	0.0023***	0.0023***
	(5.3651)	(5.0211)	(5.0211)	(5.0211)	(5.1279)	(4.9182)	(4.9182)	(4.9182)
Offering Amount	0.0002	0.0002	0.0002	0.0002	0.0001	-0.0001	-0.0001	-0.0001
	(1.5923)	(1.4159)	(1.4159)	(1.4159)	(0.6124)	(-0.0953)	(-0.0953)	(-0.0953)
Maturity	0.0001***	0.0001***	0.0001***	0.0001***	0.0001*	0.0001*	0.0001*	0.0001*
	(8.8684)	(8.0316)	(8.0316)	(8.0316)	(1.7587)	(1.8647)	(1.8647)	(1.8647)
Coupon	-0.0001*	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001
	(-1.7673)	(-0.5903)	(-0.5903)	(-0.5903)	(-0.5037)	(-0.3399)	(-0.3399)	(-0.3399)
Investment Grade	0.0014**	0.0013**	0.0013**	0.0013**	0.0029**	0.0019	0.0019	0.0019
	(2.0893)	(2.0744)	(2.0744)	(2.0744)	(2.1117)	(1.2367)	(1.2367)	(1.2367)
Number of Covenants	0.0001	0.0002**	0.0002**	0.0002**	-0.0002	-0.0002*	-0.0002*	-0.0002*
	(1.0477)	(2.3002)	(2.3002)	(2.3002)	(-1.6298)	(-1.8217)	(-1.8217)	(-1.8217)
Callable	0.0002	0.0002	0.0002	0.0002	0.0005	0.0004	0.0004	0.0004
	(1.0105)	(0.9739)	(0.9739)	(0.9739)	(1.3077)	(0.8145)	(0.8145)	(0.8145)
Convertible	-0.0015**	-0.0012	-0.0012	-0.0012	-0.0009	-0.0007	-0.0007	-0.0007
	(-1.9735)	(-1.4144)	(-1.4144)	(-1.4144)	(-0.6197)	(-0.4397)	(-0.4397)	(-0.4397)
Firm Characteristics?	N	Y	Y	Y	N	Y	Y	Y
Bond Market Characteristics?	N	N	Y	Y	N	N	Y	Y
Equity Market Characteristics?	N	N	N	Y	N	N	N	Y
Year Fixed Effect?	Y	Y	Y	Y	Y	Y	Y	Y
Firm Fixed Effect?	Y	Y	Y	Y	Y	Y	Y	Y
N	59,230	52,920	52,920	52,920	23,636	19,726	19,726	19,726
Adj. R-Squared	0.218	0.222	0.222	0.222	0.181	0.196	0.196	0.196

Table 4.12 (continued)

Panel B: Surprise Sample								
	# of Covenants >= 4				# of Covenants < 4			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Intercept	-0.0015	-0.0179**	-0.0336***	-0.0336***	-0.0015	-0.0223	-0.0344**	-0.0491***
	(-0.4356)	(-2.2185)	(-3.9179)	(-3.5424)	(-0.2300)	(-1.5639)	(-2.3772)	(-2.7822)
Negative	0.0023***	0.0020***	0.0020***	0.0020***	0.0044***	0.0042***	0.0042***	0.0042***
	(5.4855)	(4.5760)	(4.5760)	(4.5760)	(6.4424)	(5.2352)	(5.2352)	(5.2352)
Offering Amount	0.0003**	0.0003**	0.0003**	0.0003**	0.0003	0.0001	0.0001	0.0001
	(2.1712)	(2.0710)	(2.0710)	(2.0710)	(1.0230)	(0.1259)	(0.1259)	(0.1259)
Maturity	0.0001***	0.0001***	0.0001***	0.0001***	0.0001**	0.0001**	0.0001**	0.0001**
	(10.9601)	(10.3089)	(10.3089)	(10.3089)	(2.5429)	(2.4283)	(2.4283)	(2.4283)
Coupon	-0.0001	-0.0001	-0.0001	-0.0001	0.0002	0.0001	0.0001	0.0001
	(-1.3669)	(-1.0077)	(-1.0077)	(-1.0077)	(1.3657)	(1.1832)	(1.1832)	(1.1832)
Investment Grade	0.0009	0.0008	0.0008	0.0008	0.0030**	0.0016	0.0016	0.0016
	(0.9974)	(0.9942)	(0.9942)	(0.9942)	(2.5201)	(1.1610)	(1.1610)	(1.1610)
Number of Covenants	0.0001	0.0002**	0.0002**	0.0002**	-0.0003*	-0.0002	-0.0002	-0.0002
	(1.0339)	(2.0246)	(2.0246)	(2.0246)	(-1.8696)	(-1.4848)	(-1.4848)	(-1.4848)
Callable	0.0005	0.0005+	0.0005+	0.0005+	0.0007	0.0005	0.0005	0.0005
	(1.5341)	(1.8067)	(1.8067)	(1.8067)	(1.3541)	(0.9421)	(0.9421)	(0.9421)
Convertible	-0.0018*	-0.0019	-0.0019	-0.0019	0.0005	0.0016	0.0016	0.0016
	(-1.6610)	(-1.6375)	(-1.6375)	(-1.6375)	(0.4103)	(1.0619)	(1.0619)	(1.0619)
Firm Characteristics?	N	Y	Y	Y	N	Y	Y	Y
Bond Market Characteristics?	N	N	Y	Y	N	N	Y	Y
Equity Market Characteristics?	N	N	N	Y	N	N	N	Y
Year Fixed Effect?	Y	Y	Y	Y	Y	Y	Y	Y
Firm Fixed Effect?	Y	Y	Y	Y	Y	Y	Y	Y
N	31,792	28,673	28,673	28,673	12,156	10,360	10,360	10,360
Adj. R-Squared	0.268	0.267	0.267	0.267	0.221	0.232	0.232	0.232

REFERENCES

Ammann, M., Hoechle, D., and Schmid, M. (2012). Is there really no conglomerate discount? Journal of Business Finance & Accounting, 39(1‐2), 264-288.

Anderson, K. L., and T. L. Yohn. 2002. The effect of 10-K restatements on firm value, information asymmetries, and investors' reliance on earnings. Working Paper, Georgetown University.

Baginski, S.P., E.J. Conrad, and J.M. Hassell. 1993. The effects of management forecast precision on equity pricing and on the assessment of earnings uncertainty. The Accounting Review 68(4): 913-927.

Bartov, E., D. Givoly, and C. Hayn. 2002. The Rewards to Meeting or Beating Earnings Expectations. Journal of Accounting and Economics 33 (2): 173-204.

Beaver, W. 1966. Financial Ratios as Predictors of Failure. Empirical Research in Accounting: Selected Studies, 1966. Supplement to Journal of Accounting Research 4.

Berger, Philip G., and E. Ofek. Diversification's Effect on Firm Value. Journal of Financial Economics. 1995, Vol 37, p39-65.

Beyer, A., D. A. Cohen, T. Z. Lys and B. R. Walther. The financial reporting environment: Review of the recent literature. Journal of Accounting and Economics 50: 296-343.

Botosan, C.. 1997. Disclosure level and the cost of equity capital. The Accounting Review 72(3): 323-349.

Boyd, Naomi E., and J. M. Mercer. Gains from Active Bond Portfolio Management Strategies. Journal of Fixed Income. Spring 2010, Vol. 19, No.4, p73-83

Brockman, P., I.K. Khurana, and X. Martin. 2008. Voluntary disclosures around share repurchases. Journal of Financial Economics 89: 175-191.

Campa, J. M., and Kedia, S. (2002). Explaining the diversification discount. The Journal of Finance, 57(4), 1731-1762.

Chatrath, Arjun, H. Miao, S. Ramchander, and S. Villupuram. Corporate Bonds, Macroeconomics News, and Investor Flows. Journal of Fixed Income. Summer 2012, Vol.22, No.4, p25-49.

Clement, M., R., Frankel, and J. Miller. 2003. Confirming management earnings forecasts, earnings uncertainty, and stock returns. Journal of Accounting Research 41: 653-680.

Cohen, Lauren, and D. Lou. Complicated firms. Journal of Financial Economics. 2012, Vol. 104, Issue 2, p383-400.

Coller, M., and T.L. Yohn. 1997. Management forecasts and information asymmetry: An examination of bid-ask spreads. Journal of Accounting Research 35(2): 181-191.

Collin-Dufresne, Pierre, R. S. Goldstein, and J. S. Martin, The determinants of credit spread changes. Journal of Finance. 2001, Vol. 56, No. 6, p2177-2207.

Copeland, T., and D. Galai. 1983. Information effects on the bid-ask spread. Journal of Finance 38(5): 1457-1469.

Core, J.E. 2001. A review of the empirical disclosure literature: discussion. Journal of Accounting and Economics 31: 441-456.

Daniel, K., and S. Titman. Evidence on the characteristics of cross sectional variation in stock returns. Journal of Finance. 1997, Vol. 52, Issue 1, p1-33.

DeChow, P., R. Sloan, and A. Sweeney. 1996. Causes and Consequences of Earnings Manipulation: An Analysis of Firms Subject to Enforcement Actions by the SEC. Contemporary Accounting Research 13 (1), 1-36.

DeFond, M. and M. Hung. 2003. An Empirical Analysis of Analysts' Cash Flow Forecasts. Journal of Accounting and Economics 35: 73-100.

Dhaliwal, D.S., O.Z Li, A. Tsang, and Y.G. Yang. 2011. Voluntary nonfinancial disclosure and the cost of equity capital: The initiation of corporate social responsibility reporting. The Accounting Review 86(1): 59-100.

Diamond, D.W. and R.E. Verrecchia. 1991. Disclosure, liquidity, and the cost of capital. Journal of Finance 46(4): 1325-1359.

Dimitrov, V., and S. Tice. Corporate Diversification and Credit Constraints: Real Effects across the Business Cycle. Review of Financial Studies. 2006, Vol. 19, Issue 4, p1465-1498.

Elton, E. J., M. J. Gruber, D. Agrawal, and C. Mann. Explaining the rate spread on corporate bonds. Journal of Finance. 2001, Vol. 56, Issue 1, p247-277.

Fama, E., and K. R. French. Common risk factors in the returns of stocks and bonds. Journal of Financial Economics. 1993, Vol. 33, Issue 1, p3-56.

Francis, J.R., I.K. Khurana, and R. Pereira. 2005. Disclosure incentives and effects on cost of capital around the world. The Accounting Review 80(4): 1125-1162.

Francis, J., D. Nanda, and P. Olsson. 2008. Voluntary disclosure, earnings quality, and cost of capital. Journal of Accounting Research 46(1): 53-99

Galvani, Valentina, and S. Landon. Riding the yield curve: a spanning analysis. Review of Quantitative Finance and Accounting. 2013, Vol.40, p135-154.

Gebhardt, W. R., S. Hvidkjaer, and B. Swaminathan. The cross-section of expected corporate bond returns: Betas or characteristics? Journal of Financial Economics. 2005, Vol. 75, Issue 1, p85-114.

Glosten, L. and P. Milgrom. 1985. Bid, ask and transaction prices in a specialist market with heterogeneously informed traders. Journal of Financial Economics 14(1): 71-100.

Graham, J. R., C. R. Harvey, and S. Rajgopal. 2005. The economic implications of corporate financial reporting. Journal of Accounting and Economics 40: 3-73.

Graham, J.R., S. Li., and J. Qiu. 2008. Corporate misreporting and bank loan contracting. Journal of Financial Economics 89(1): 44-61.

Healy, P., and J. Wahlen. 1999. A Review of the Earnings Management Literature and Its Implications for Standard Setting. Accounting Horizons 13 (2): 365-383.

Hirst, D.E., L. Koonce, and S. Venkataraman. 2008. Management earnings forecasts: A review and framework. Accounting Horizons 22(3): 315-338.

Hoechle, D., Schmid, M., Walter, I., and Yermack, D. (2012). How much of the diversification discount can be explained by poor corporate governance? Journal of Financial Economics, 103(1), 41-60.

Hribar, P., and N. T. Jenkins. 2004. The Effect of Accounting Restatements on Earnings Revisions and the Estimated Cost of Capital. Review of Accounting Studies 9: 337-356

Hutton, A.P., G.S. Miller, and D.J. Skinner. 2003. The role of supplementary statements with management earnings forecasts. Journal of Accounting Research 41(5): 867-890.

Hutton, A.P., and P.C. Stocken. 2009. Prior forecasting accuracy and investor reaction to management earnings forecasts. SSRN Working Paper.

Karpoff, J. M., D. S. Lee, and G. S. Martin. 2008. The consequences to managers for financial misrepresentation. Journal of Financial Economics 88: 193-215.

Kim, J.W., and Y. Shi. 2011. Voluntary disclosure and the cost of equity capital: Evidence from management earnings forecasts. Journal of Accounting Public Policy 30: 348-366.

Kim, Y., and M. Song. 2014. Management earnings forecasts and value of analyst forecast revisions. Management Science: 1-21.

Kinney Jr., W. R., L.S. McDaniel. 1989. Characteristics of firms correcting previously reported quarterly earnings. Journal of Accounting & Economics 11: 71-93.

Kothari, S.P,, S. Shu, and P.D. Wysocki. 2009a. Do managers withhold bad news? Journal of Accounting Research 47(1): 241-276.

Kothari, S.P., X. Li, and J.E. Short. 2009b. The effect of disclosures by management analysts, and business press on cost of capital, return volatility, and analyst forecasts: A study using content analysis. The Accounting Review 84(5): 1639-1670.

Laeven, L., and R. Levine. Is there a Diversification Discount in Financial Conglomerates? Journal of Financial Economics. 2007. Vol 85, Issue 2: p331-367.

Lang, L. H., and Stulz, R. M. 1994. Tobin's q, corporate diversification and firm performance. Journal of Political Economy 102, 1248-1280.

Lee, L. F. 2012. Incentives to Inflate Reported Cash from Operations using Classification and Timing. The Accounting Review 87 (1): 1-33.

Lev, B., and S.H. Penman. 1990. Voluntary forecast disclosure, nondisclosure, and stock prices. Journal of Accounting Research 28(1): 49-76.

Mansi, S. A., and Reeb, D. M. (2002). Corporate diversification: what gets discounted? The Journal of Finance, 57(5), 2167-2183.

Meek, G.K., C. B. Roberts and S. J. Gray. 1995. Factors influencing voluntary annual report disclosures by U.S., U.K. and continental European multinational corporations. Journal of International Business Studies 26(3): 555-572.

Merkley, K.J., L.S. Bamber, and T.E. Christensen. 2013. Detailed management earnings forecasts: do analysts listen? Review of Accounting Studies 18: 479-521.

Merton, R.C. 2974. On the pricing of corporate debt: the risk structure of interest rates. Journal of Finance 29(2): 449-470.

Monk, C.W. Evergreen Manager Focuses on Cash Flow. The Wall Street Journal (March 19, 2002): C19.

Ohlson, J. A. 1980. Financial Ratios and the Probabilistic Prediction of Bankruptcy. Journal of Accounting Research 18 (1): 109-131.

Palmrose, Z., V. J. Richardson, and S. Scholz. 2004. Determinants of market reactions to restatement announcements. Journal of Accounting and Economics 37: 59-89

Pelaez, R. F. Riding the yield curve: Term premiums and excess returns. Review of Financial Economics. 1997, Vol. 6, Issue 1: p113-119.

Pittman, J.A. and S. Fortin. 2004. Auditor choice and the cost of debt capital for newly public firms. Journal of Accounting and Economics 37: 113-136.

Pownall, G., C. Wasley, and G. Waymire. 1993. The stock price effects of alternative types of management earnings forecasts. The Accounting Review 68(4): 896-912.

Rajan, R., H. Servaes, and L. Zingales. 2000. The Cost of Diversity: The Diversification Discount and Inefficient Investment. Journal of Finance. Vol. 55, p35-80.

Richardson, K. 2006. Gray Area of Cash Flow. The Wall Street Journal (January 18, 2006): C5.

Richard, C. 2002. Dynegy Cash Flow Restatement is Credit Market Nightmare. Dow Jones Capital Markets Report (April 29, 2002).

Rogers, J.L., and P.C. Stocken. 2005. Credibility of management forecasts. The Accounting Review 80: 1233-1260.

Ruland, W., S. Tung, and N. E. George. 1990. Factors associated with the disclosure of managers' forecasts. The Accounting Review 65(3): 710-721.

Sanzhar, S. V. Discounted but not diversified: Organizational structure and conglomerate discount. 2006, SSRN working paper.

Scharfstein, D. S., and Stein, J. C. (2000). The dark side of internal capital markets: Divisional rent‐seeking and inefficient investment. The Journal of Finance, 55(6), 2537-2564.

Shi, C. and S. W. Zhang. 2007. Accounting Restatements and the Cost of Debt Capital. Working Paper.

Sengupta, P. 1998. Corporate disclosure quality and the cost of debt. The Accounting Review 73 (Spring), 459–474.

Skinner, D.J. 1994. Why firms voluntarily disclose bad news. Journal of Accounting Research 32(1): 38-60

Standard & Poor's. 2008. Corporate Ratings Criteria. http://www.nafoa.org/pdf/CorprateCriteriaBook-2008.pdf

Teoh, S. H., I. Welch, and T. J. Wong, 1998. Earnings management and the underperformance of seasoned equity offerings, Journal of Financial Economics 50, 63-99.

United States Government Accountability Office. 2006. GAO-06-1053R. http://www.gao.gov/products/GAO-06-1053R

Villalonga, B., 2004, Does diversification cause the diversification discount? Financial Management 33, 5-27.

Wilson, W. M. 2008. An empirical analysis of the decline in the information content of earnings following restatement. The Accounting Review 83(2), 519-548.

Zhang, G.. 2001. Private information production, public disclosure, and the cost of capital: Theory and implications. Contemporary Accounting Research 18(2): 363-384.

APPENDIX A: VARIABLE DEFINITION IN CHAPTER 2

Variable Name	Variable Definition
Single	Single = 1 if the bond is issued by a standalone firm, = 0 otherwise
Coupon	Coupon rate of the bond in percentage
Maturity	Time until the bond's maturity in years
Rating	Moody's or S&P rating number. Rating number of 1 stands for the highest rating Aaa+/AAA+, while 11 stands for the lowest rating in investment grade Baa3/BBB-
Age	Time lapse since the bond's issuance in years
Amount Outstanding	The natural log of amount outstanding. Amount outstanding is measured in dollars.
Callable	Callable = 1 if the bond is callable, = 0 otherwise
Sinking Fund	Sinking fund = 1 if the bond has a sinking fund provision, = 0 otherwise
Trading Volume	Total trading volume in a given year from both NAIC and TRACE standardized by the amount outstanding of the same year.
Number of Trades	Total number of trades in a given year from NAIC and TRACE, measured in thousands.
Interest Rate	Annual risk-free rate obtained from Kenneth French's website, measured in percentage†
Slope	Annual average of monthly yield difference between 10-year treasury constant maturity rate and 1-year treasury constant maturity rate, measured in percentage. Rate obtained from FRED Economic Data, Federal Reserve Bank of St. Louis‡
Interest Rate Volatility	Annual standard deviation of weekly 3-month Treasury bill secondary market rate, measured in percentage. Rate obtained from FRED Economic Data, Federal Reserve Bank of St. Louis‡
Default Risk	Annual average of monthly yield difference between Moody's seasoned Aaa corporate bond and Moody's seasoned Baa corporate bond, measured in percentage. Rate obtained from FRED Economic Data, Federal Reserve Bank of St. Louis‡

APPENDIX A (continued)

Market risk premium, SMB, HML	Annual Fama-French factors obtained from Kenneth French's website[†]
Log (Total Assets)	Logarithm of the book value of total assets.
Market to Book	Ratio of book assets plus the difference between the market and book values of equity to book assets.
Market Leverage	The ratio of book value of debt (debt in current liabilities + long-term debt) to market value of total assets.
Log (Sales)	Logarithm of firm's total sales.
Earnings Volatility	Standard deviation of EBIT in the past three years.
Sales Growth	Annual sales growth.
Free Cash Flow	The ratio of operating income before depreciation – interest expense – income tax – capital expenditures to book value of total assets.
ROA	Return on assets. Operating income before depreciation divided by total assets.
Z-score	Z score for manufacturing firms = 1.2 × (working capital/assets) + 1.4 × (retained earnings/assets) + 3.3 × (EBIT/assets) + 0.6 × (market value of equity/book value of total liabilities) + 0.999 × (sales/assets); Z score for non-manufacturing firms = 6.56 × (working capital/assets) + 3.2 × (retained earnings/assets) + 6.72 × (EBIT/ assets) + 1.05 × (market value of equity/ book value of total liabilities). Working capital is calculated as current assets minus current liabilities. EBIT is "Earnings before interest and taxes" as reported by Compustat ("EBIT"). Book value of total liabilities is "Liabilities − Total" as reported by Compustat ("LT").

[†]: Please see Kenneth French's website: http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html#HistBenchmarks for detailed variable definition.

[‡]: FRED Economics Data from Federal Reserve Bank of St. Louis: http://research.stlouisfed.org/fred2/.

APPENDIX B: VARIABLE DEFINITION IN CHAPTER 4

Variable Name	Variable Definition
Positive	Positive = 1 if the there's positive surprise in the announcement, = 0 otherwise
Negative	Negative = 1 if the there's negative surprise in the announcement, = 0 otherwise
Offering Amount	The natural log of offering amount. Amount outstanding is measured in dollars.
Maturity	Time until the bond's maturity in years
Coupon	Coupon rate of the bond in percentage
Investment Grade	Moody's rating of the bond when it's issued. Investment grade = 1 if the rating is Aaa, Aa, A or Baa, = 0 otherwise
Number of Covenants	Total number of covenant categories
Callable	Callable = 1 if the bond is callable, = 0 otherwise
Convertible	Convertible = 1 if the bond is convertible, = 0 otherwise
Size	Logarithm of market value of assets, where market value of assets is book value of assets plus the difference between the market and book values of equity.
Market to Book	Ratio of book assets plus the difference between the market and book values of equity to book assets.
Market Leverage	The ratio of book value of debt (debt in current liabilities + long-term debt) to market value of total assets.
Cash Holding	The ratio of cash and marketable securities to book value of assets.
Free Cash Flow	The ratio of operating income before depreciation – interest expense – income tax – capital expenditures to book value of total assets.
Sales Growth	Annual sales growth in decimal.

APPENDIX B (continued)

Capital Expenditure	The ratio of capital expenditure to book value of assets.
PP&E	The ratio of Property, Plant and Equipment (PP&E) to book value of assets.
ROA	Return on total assets. The ratio of operating income before depreciation to book value of total assets.
Interest Rate	Annual risk-free rate obtained from Kenneth French's website, measured in percentage†
Slope	Annual average of monthly yield difference between 10-year treasury constant maturity rate and 1-year treasury constant maturity rate, measured in percentage. Rate obtained from FRED Economic Data, Federal Reserve Bank of St. Louis‡
Interest Rate Volatility	Annual standard deviation of weekly 3-month Treasury bill secondary market rate, measured in percentage. Rate obtained from FRED Economic Data, Federal Reserve Bank of St. Louis‡
Default Risk	Annual average of monthly yield difference between Moody's seasoned Aaa corporate bond and Moody's seasoned Baa corporate bond, measured in percentage. Rate obtained from FRED Economic Data, Federal Reserve Bank of St. Louis‡
Market risk premium, SMB, HML	Annual Fama-French factors obtained from Kenneth French's website†

†: Please see Kenneth French's website: http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html#HistBenchmarks for detailed variable definition.

‡: FRED Economics Data from Federal Reserve Bank of St. Louis: http://research.stlouisfed.org/fred2/.