Cash Flow Management and Bond Rating Quality

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ABSTRACT: This paper examines the impact of cash flow management on the quality of bond ratings. Based on a sample of bonds issued by U.S. firms, we find CFO management affects bond rating quality, even after controlling for incentives to manage earnings. Specifically, we find CFO management reduces credit ratings predictability of debt default, increases the likelihood of missed defaults (i.e., more Type I errors), reduces the likelihood of assigning harsh ratings to non-defaulting issues (i.e., fewer Type II errors), and weakens rating informativeness as reflected in the association between bond ratings and bond yield spread. However, we do not find these bond rating qualities to be consistently associated with accrual-based earnings management. We also find the effects of CFO management on bond rating qualities are more pronounced for large debt issuers and less pronounced for financially-constrained firms. Taken together, our evidence highlights the range of adverse effects of CFO management on the quality of bond ratings and points to the trade-off of conflict of interest and reputational considerations faced by credit rating agencies.

Keywords: Cash flow from operations; Bond rating quality; Credit rating agencies

Cash Flow Management and Credit Rating Quality

1. Introduction

Credit rating agencies (CRA) emphasize cash flow analysis as the single most critical aspect of credit rating decisions (Standards and Poor's 2008). In part, the focus on a firm's cash flows stems from a stated belief that it is unlike a firm's earnings in that it cannot be easily manipulated. Moody's (2006) notes that

> Measures of cash flow (e.g. free cash flow or operating cash flow) are useful because they are more difficult to manage or manipulate than are earnings or EPS (e.g., through the timing of recognition of accounting costs or, in the case of EPS, share buybacks). However, Moody's views EBITDA as a flawed metric and a poor measure of cash flow to the extent it is used for that purpose, particularly for healthy companies in good periods. This is true in part because EBITDA can easily be manipulated through aggressive accounting.

Contrary to this belief, recent evidence suggests that firms do indeed act to manage their reported cash flows with an eye towards influencing their credit ratings. For example, Lee (2012) finds that firms tend to inflate their reported cash flows from operations (CFO) when they have a long-term credit rating near the investment/non-investment grade cut-off. To the extent that firms undertake CFO management to influence their credit ratings, it raises questions as to whether it will have a detrimental impact on the quality of credit ratings. We focus on this issue in this paper. Specifically, we examine the relation between CFO management and the quality of bond ratings. By ratings quality, we broadly mean the predictive and informativeness attributes of bond ratings as well as bond rating errors.

It is not ex-ante clear whether CFO management will hurt bond ratings quality. For example, there are several arguments as to why CFO management can have a

negligible impact on credit ratings quality. For example, CRAs are often characterized as sophisticated users of firm financial statements. The implication here is that CRAs will undo any manipulation undertaken by the bond issuer. As evidence, Kraft (2012) finds CRAs modify firm financial statements to account for a borrower's off-balance-sheet financing. If the CRAs are able to detect and account for CFO management, then such manipulation will not affect bond ratings quality. CRAs also face incentives to undertake due diligence to correct for CFO management. CRAs are long term players in the credit markets and their viability depends on their reputation to provide high quality credit ratings (e.g., Diamond 1989; Chemmanur and Fulghieri 1994; Smith and Walter 2001; Partnoy 2006; Goel and Thakor 2010). The underlying assumption is that quality ratings translate into future economic rents for the rating agency (Becker and Milbourn 2011). The reputation view suggests that credit rating agencies do not simply rely on firms' financial statements but rather expend resources in gathering private firm-specific information and carefully process the gathered information to provide high quality ratings. Thus, a firm's use of CFO management is not likely to affect the quality of bond ratings since reputational concerns incentivize CRAs to take into account CFO manipulation in formulating their credit rating decisions.

The aforementioned prediction presumes that CRAs will undertake the necessary due diligence to limit the effects of CFO management on credit ratings. However, recent research notes that CRAs face incentives such that they may not carry out the needed due diligence. Principally, Becker and Milbourn (2011) note that ratings agencies revenues are derived from bond issuers and as such it creates a basic tension "between the desire of raters to please individual paying customers and the raters' need to maintain the overall

precision and informativeness of credit ratings." To the extent that credit rating agencies focus on maintaining their relation with the bond issuers, they may not carefully scrutinize CFO reported by these issuers. In this setting, CFO management can impair the quality of bond ratings.

To sort out the competing predictions, we undertake an empirical examination of the relation between the management of cash flows from operations and multiple dimensions of bond rating quality. First, we focus on ratings predictability. By ratings predictability, we mean the ability of bond ratings to predict default events one-year ahead. Ratings quality declines if CFO management reduces ratings predictability. Second, we look at the likelihood of ratings errors. We focus on two types of errors: Type I errors, i.e. instances where the rating agencies assign/maintain favorable ratings to issues that default within the next year; and Type II errors, i.e., instances where the rating agencies assign/maintain unfavorable ratings to issues that do not default within the next year. If CFO management impairs credit ratings quality in the form of rating inflation, it should be positively associated with Type I errors and negatively associated with Type II errors. Finally, we focus on the information content of bond ratings defined as the ability of ratings to predict bond yield spread. CFO management adversely affects ratings quality if it reduces the information content of ratings.

We follow Lee (2012) in constructing our measure of CFO management. Specifically, we derive unexpected cash flow from operations by decomposing cash flow from operations into expected and unexpected components using the model developed by Dechow et al. (1998) and implemented by Lee (2012). The unexpected component of CFO actually captures two types of CFO management. One type only affects cash flows

from operations but does not affect earnings. For example, firms can increase reported CFO by delaying payments to suppliers and accelerating collections from customers or by just simply shifting items among the statement of cash flows categories. The other type affects both CFO and earnings. For instance, reducing discretionary expenses increases both earnings and CFO (Dechow and Sloan 1991; Roychowdhury 2006). Therefore, we examine the impact of CFO management with and without controlling for firms' incentives to manage earnings.

Our results based on a sample of bonds issued by U.S. firms issuing bonds from 1994 to 2010 can be summarized as follows. We find CFO management is negatively associated with ratings predictability, particularly for issues with investment-grade rating. We also find CFO management increases the likelihood of Type I errors, and reduces the likelihood of Type II errors. Lastly, we find a negative association between CFO management and the information content of credit ratings. We find these results are robust to the inclusion of several firm-specific and issue-specific determinants known to influence the bond credit ratings. Taken together, our results indicate that CFO management adversely affects bond ratings quality.

Moreover, our empirical findings hold using a number of sensitivity analyses. First, the results are robust to industry-specific and year-specific time-invariant variables. Second, our results are robust to the control for firms' incentives to manage earnings using accruals or real activities such as overproduction. Third, the results are qualitatively similar when we focus on a specific mechanism that is used to manage cash flows without influencing earnings, namely, timing certain transactions such as delaying payments to suppliers or accelerating collections from customers. In addition, our results

hold using performance-adjusted measure for CFO management and can even be extended to rating quality over three-year window. More importantly, the results are robust to firm-specific time-invariant variables. Further, we use the semi-natural experiment of SOX to confirm that our results are driven by rating agencies' perverse incentives, rather than a lack of expertise. Specifically, we find that the adverse impact of CFO management is significantly reduced in the post-SOX period. All these sensitivity analyses mitigate endogeneity concerns from different angles, pointing to the causal effect of CFO management on bond rating quality. Nevertheless, we acknowledge that we may not establish the causal relations as strong as natural experiments do.

To further shed light on the causal relation, we examine for potential heterogeneity in the CFO management-bond rating quality relation. To this end, we first examine whether the impact of CFO management on bond rating properties differs between large and small debt issuers. As noted earlier, it is the bond issuers and not the investors that pay the credit rating agencies for the ratings obtained. Given this revenue model, conflicts of interest can arise where the credit rating agencies fail to undertake the necessary due diligence to detect and correct for CFO management undertaken by the bond issuers. Such conflicts of interest can be more acute for larger bond issuers because they often represent a significant portion of a credit rating agency's revenue stream. Our evidence supports this prediction in that we find the adverse effect of CFO management on credit ratings quality is more pronounced for larger debt issuers.

We also examine the impact of financial constraints on the relation between CFO management and the various bond rating properties. As noted earlier, credit rating agencies are likely to provide greater scrutiny when their reputation is at stake. Such

reputational concerns can induce CRAs to undertake closer scrutiny of financially-constrained firms because these firms face a higher likelihood of debt default. The failure of a debt issuer, particularly an unanticipated failure, can harm a credit rating agency's reputation. It can also bring more attention from regulatory bodies such as the U.S. Securities and Exchange Commission. In light of these concerns, credit rating agencies are likely to be more vigilant against opportunistic reporting by financially-constrained bond issuers. Our evidence is consistent with this prediction in that the adverse impact of CFO management on bond rating quality is less pronounced for financially-constrained issuers.

Overall, our study contributes to several streams of extant literature. First, we add to the literature on the determinants of credit rating quality. Becker and Milbourn (2011) find increased competition is associated with lower credit ratings quality. Specifically, they find the entry of Fitch rating agency had an adverse effect on the quality of credit ratings issued by Standards & Poor's (S&P) and Moody's. Separately, Jiang et al. (2012) find a decline in the credit ratings quality (i.e. higher ratings inflation) after S&P switched its business model from investor-pay to issuer-pay fees. However, Bonsall (2012) documents an improvement in the quality of bond rating after a switch to an issuer-pay business model. In contrast to the focus on CRA competition and business model, we examine how issuer behavior affects bond credit ratings quality. In this respect, our paper is distinct from prior studies such as Alissa et al. (2013) who examine the use of earnings management to target capital structure through firm ratings. To our best knowledge, we are the first to examine whether issuers' CFO management diminishes bond ratings quality. The broader implication of our paper is that management

of cash flow from operations, rather than earnings management, impairs bond rating quality.

We also contribute to the research on CFO management. Prior studies have emphasized the use of accounting discretion in relation to accruals to achieve various performance and contracting objectives (e.g., Healy 1985). However, Roychowdhury (2006) has argued and found that firms also undertake costlier real earnings management. More germane to our study is Lee (2012) who argues that firms undertake CFO management ex ante in response to credit rating related incentives. In particular, she finds firms inflate their reported CFO when their ratings are near the investment/non-investment grade cutoff. We depart from Lee (2012) in that we directly evaluate whether and when CFO management affects bond rating quality ex post.

The rest of the paper is structured as follows. In Section 2, we review the relevant literature and develop testable hypotheses. Section 3 describes the sample, and Section 4 presents the research design and empirical findings. Section 5 reports additional tests and Section 6 concludes the paper.

2. Hypothesis development

Cash flow from operations is an important variable in the rating decision-making process of credit rating agencies (Standard & Poor's 2008). Cash flow from operations impacts a firm's liquidity and as such is expected to lower credit spreads and default probabilities (Acharya et al. 2012). Given the impact of CFO on default risk, it creates incentives for firms to manipulate their reported cash flow numbers to obtain favorable credit ratings. Lee (2012) find firms with a long-term credit rating near the investment/non-investment grade cut-off report inflated cash flows from operations. In a

similar vein, Alissa et al. (2013) examine the use of accounting discretion to manage firm ratings levels and find that firms undertake accrual and real earnings management to achieve benchmark firm rating levels. While the evidence supports a link between CFO management and credit ratings, it is far from clear whether and when CFO management can diminish multiple dimensions of bond rating quality. The issue of whether CFO management serves to impair the predictability of credit ratings in relation to future defaults, or generate an upward rating bias, or reduce the informativeness of credit ratings to bond market investors, is crucial because several entities, for instance, investors and financial regulators, strongly rely on credit ratings.

In part, the lack of clarity stems from the differing views on credit rating agencies. One view is that CRAs have substantial expertise in gathering and processing information to assess a bond issue's credit risk. The implication of this view is that CFO management will have no bearing on credit ratings. However, a number of recent studies have noted credit rating decisions are shaped by the incentives they face.[1] These incentives can be broadly grouped into two categories: reputational concerns and conflicts of interest.

The reputational concerns argument posits that such concerns induce CRAs to issue accurate credit ratings. In relation to the reputation mechanism, Becker and Milbourn (2011) argue that reputation for "honest and accurate ratings" may benefit the credit ratings agencies in generating higher revenues through future business opportunities. The credit rating agencies themselves emphasize the importance of reputation (Partnoy 2006). Consistent with this reputation argument, research has found a positive association between CRA reputation and their ability to obtain higher revenues

[1] For example, Jiang et al. (2012) find a switch in the business model of credit rating agencies from investor to issuer pay fees increased credit ratings.

(Cantor and Parker 1995).[2] Given the importance of their reputation, CRAs will optimally expend resources to gather and process a broad set of information subject to their cost constraints (Goel and Thakor 2010). The resulting implication is that CRAs will provide accurate ratings.

The second category of incentives relates to the conflicts of interest faced by CRAs. A major source of these conflicts is the issuer-pay business model in the rating industry since 1970s. Under the issuer-pay model, the raters are paid for their work by the bond issuers, rather than by investors who actually use the ratings (e.g., Economist 2005). Another source of such conflicts is the joint provision of rating and consulting services to clients. Such consulting services can involve advice to the bond issuer in relation to their assigned ratings (e.g., Jung et al. 2013). When a substantial portion of a CRA's revenues is tied to a bond issuer, the CRA may lower its scrutiny in relation to the client involved and provide more favorable ratings (e.g., Jiang et al. 2012; Kraft 2010; Xia 2010).

We acknowledge that the incentives related to reputational concerns and conflicts of interest are not mutually exclusive. However, they provide conflicting predictions on the relation between CFO management and multiple dimensions of bond rating quality. Specifically, we examine a range of credit rating properties in the following sections: credit ratings predictability, accuracy, and informativeness.

2.1 CFO management and bond ratings predictability

The fundamental role of bond ratings is to predict future default. Also, a firm's cash flows from operations are viewed as a key determinant of default risk. Thus, CFO management can adversely affect ratings predictability unless the CRAs correctly adjust

[2] Also, Smith and Walter (2001) find bond issuers' demand for rating services highly relies on the CRAs' reputation perceived by the investors.

for the cash flow manipulation involved. Whether they do such adjustment or otherwise is an empirical question. The reputational-concern argument suggests that CRAs value accuracy and hence CFO management will have no effect on ratings predictability. However, conflict of interest can lead CRAs to overlook the cash flow management. This conflict-of-interest argument suggests that CFO management will impair ratings predictability. This leads to the following hypotheses:

H1a: CFO management has no impact on ratings predictability, *ceteris paribus* (reputational-concern perspective).

H1b: CFO management impairs ratings predictability, *ceteris paribus* (conflict-of-interest perspective).

2.2 CFO management and bond ratings accuracy

Evidence of CFO management affecting credit ratings also suggests that CFO management will have an adverse impact on ratings accuracy. Ratings accuracy relates to the likelihood of two types of credit rating errors. Specifically, a CRA may fail to adjust its credit rating downwards to reflect an increase in the likelihood of default. This is usually referred to as a Type I error. A CRA may also make a Type II error where it adjusts its credit ratings downwards even though there is no marked change in the likelihood of default. To the extent that CFO management is undertaken to obtain more favorable ratings, it increases the likelihood of a Type I error and lowers the likelihood of a Type II error. To be sure, these predictions rely on whether CRAs' behavior is influenced by conflicts of interest wherein they do not carefully consider a bond issuer's manipulation of its reported cash flows. In contrast, if the reputational-concern view holds, CFO management should have no bearings on ratings errors. This leads to the following hypotheses:

H2a: CFO management has no impact on Type I and Type II errors, *ceteris paribus* (reputational-concern perspective).

H2b: CFO management increases (decreases) the likelihood of Type I errors (Type II errors), *ceteris paribus* (conflict-of-interest perspective).

2.3 CFO management and informativeness of bond ratings

Bond credit ratings represent an important source of information to investors. To the extent that investors regard CRAs' reputational concern to dominate the rating decision-making and view credit ratings to reflect an accurate assessment of bond issuers' credit risk, CFO management will not affect the association between bond ratings and bond yields.[3] However, if investors perceive that there are conflicts of interest wherein CRAs overlook issuers' use of CFO management to obtain favorable ratings, then CFO management can attenuate the relation between bond ratings and bond yields. This leads to the following hypotheses:

H3a: CFO management has no effect on the relation between credit ratings and bond yields, *ceteris paribus* (reputational-concern perspective).

H3b: CFO management negatively affects the relation between credit ratings and bond yields, *ceteris paribus* (conflict-of-interest perspective).

The discussion so far has focused on the net effect of CFO management on the level, predictability, accuracy, and informativeness of credit ratings. The objective was to assess whether, on average, the reputational-concern view dominates the conflict-of-interest perspective or vice versa. As we noted earlier, these two views are not mutually exclusive.

To further explore the empirical validity of these two views, we examine situations where theory suggests either the conflict of interest or the reputational concern

[3] Because of the intensive information search by underwriters and potential institutional investors that normally accompanies a new bond issue, bond yields are likely to incorporate all publicly available pertinent information.

to be dominant. With respect to the conflict-of-interest perspective, we focus on issuer size. Large debt issuers represent an important source of revenue for credit rating agencies. This economic bond between rating agencies and these large issuers can incentivize the CRAs to cater to their clients' preferences. The resulting conflict of interest can overwhelm the reputational concerns of CRAs, especially for large issuers. Consistent with this argument, Bonsall (2012) finds the informativeness of the credit ratings of large issuers declined after the ratings industry switched its business model from investor-pay to issuer-pay fees. To evaluate the dominance of conflict-of-interest perspective in relation to issuer size, we group firms based on issuer size and examine whether the impact of CFO management on credit rating properties differs between small and large debt issuers.

Reputational concerns may not matter as much if the bond issuer is less likely to default on its debt. However, this is not true for financially-constrained issuers because they face a higher default risk arising from limited access to capital markets (e.g., Baker et al. 2003; Korajczyk and Levy 2003; Lamont et. al. 2001). A failure to anticipate debt default can diminish a CRA's reputation. Hence, we expect reputational concerns to be more binding when an issuer is financially constrained. As such, we examine whether the relation between CFO management and credit ratings properties varies as a function of a firm's financial constraints. To evaluate the dominance of the reputational concerns perspective, we group firms based on financial constraints and examine whether the impact of CFO management on credit rating properties differs between high- and low-financially constrained firms.

3. Sample selection

Our sample consists of bonds issued by U.S. public corporations from 1994 -2010 and rated by the three nationally recognized agencies covered by Fixed Investment Securities Database (FISD): Moody's, S&P's, and Fitch.[4] We collect data for several items from FISD: (1) default information (e.g., default date and default type); (2) credit rating information (e.g., credit ratings levels and rating change dates); (3) issue-specific information; and (4) bond yields at issuance. Financial statement data relating to issuer characteristics were obtained from Compustat. We exclude from our sample bonds issued by public utilities and financial services firms because of their unique risk characteristics. Further, we exclude observations with total assets less than 1 million dollars. After excluding bond issues with missing data on the various issue and issuer characteristics discussed below, our sample for the rating predictability tests consists of 93,736 observations. Since we focus on several rating properties, our sample composition changes for different empirical tests designed to assess the impact of CFO management on various dimensions of rating quality. Most of our empirical tests use a comprehensive sample of defaulting and non-defaulting rated bonds (e.g., rating predictability tests), while others are based on a sample of initial bond issues (e.g., informativeness tests).

4. Research design and empirical analyses

4.1 Test of hypothesis H1a/H1b

4.1.1 Empirical model

To examine the impact of CFO management on rating predictability, we relate default events one year out to broad indicators for whether a bond issue is assigned an investment-grade rating or to current ratings, and allow the effect of the investment-grade

[4] We start in fiscal year1994 because FISD provides very limited coverage of bond issues before 1994.

rating indicator or the general rating levels to vary with unexpected cash flows. Specifically, we estimate the following logit regression model:

$$DEFAULT = \alpha_0 + \beta_1 UCFO + \beta_2 RATE + \beta_3 UCFO \times RATE + \sum_{q=4}^{m} \beta_q (q^{th} Control\ Variables) + \sum Industry + \sum Year + \varepsilon \quad (1)$$

where *DEFAULT* is an indicator variable that takes 1 if there is a default event within one year from the rating date, 0 otherwise; *RATE* is either *IG* or *RATING*, where *IG* is 1 if the credit ratings are within the investment-grade category, 0 otherwise; where *RATING* is the assigned numerical code for various Moodys', S&P's, and Fitch's issue credit ratings (as detailed in Appendix A) such that higher codes reflect ratings closer to default ratings and all other variables are as defined before.[5] All other variables are described below and defined in Appendix B. If CFO management impairs ratings predictability, we expect β_3 to be positive (negative) while using *IG* (*RATING*). However, if CFO management does not impair ratings predictability, β_3 will not be positive (negative) while using *IG* (*RATING*).

To address the issue of reverse causality, we require that the *UCFO* variable, our proxy for CFO management, is based on financial statements issued one year before the updates of credit ratings. To alleviate concerns about the potential time-series and cross-sectional dependence in the data, we report z-statistics using Huber-White standard errors corrected for firm clustering (Petersen 2009; Gow et al., 2010).

4.1.2 Test variable

We measure the extent of CFO management using unexpected CFO based on a model developed by Dechow et al. (1998) and implemented by Lee (2012). Specifically,

[5] About 3.5% of the observations in our sample have default events.

we estimate the following model using data for each industry (based on two-digit SIC code) in each year with at least 10 observations:[6]

$$CFO_t/TA_{t-1} = \lambda_0 + \lambda_1(1/TA_{t-1}) + \lambda_2(SALE_t/TA_{t-1}) + \lambda_3(\Delta SALE_t/TA_{t-1}) + \varepsilon \quad (2)$$

where *CFO* is the operating cash flows for the period t, *TA* is the total assets for the period t-1, *SALE* is the sales during period t, and Δ*SALE* is change in sales during period t. We then use the parameter estimates from equation (2) to generate expected CFO and measure unexpected level of cash flow from operations (*UCFO*) as deviations from the normal levels (i.e., the residual from the estimation model). Higher values of *UCFO* imply more CFO management.[7]

4.1.3 Control variables

Control variables included in our model are drawn primarily from prior research on the determinants of corporate bond ratings and categorized into the following groups: (i) issuer characteristics; (ii) general issue characteristics; and (iii) special issue characteristics (See Appendix A for detailed definition of these control variables). We also include unexpected accruals (*ABACC*) to control for systematic variation in

[6] The cross-sectional version of the Dechow et al. (1998) model is chosen over its time-series counterpart as used by Lee (2012) for a number of reasons. First, the cross-sectional model generates a larger sample. Second, the number of observations per model is considerably higher for the cross-sectional model: a median of 31 for the cross-sectional model versus only 10 for the time-series. This increases the precision of the estimates. Third, the time-series model is estimated over a period of up to ten years. Because of the lengthy time periods involved, it is possible for the models to be misspecified due to non-stationarity. Fourth, the parameter estimates are better specified for the cross-sectional versions than the time-series versions. For example, the average standard errors of the coefficients are lower and there are fewer outliers. Lastly, Lee (2012) acknowledges that time series analysis requires firm-level data over a long time period, which could bias the sample towards mature, stable firms.

[7] While similar proxies have been used to capture real earnings management, we view our proxy as a valid measure of CFO management for several reasons. First, Lee (2012) conducted numerous tests to validate this measure as a proxy for CFO management, in particular, using a sample of firms known to have managed CFO. Second, the impact of real activities management on CFO is unclear *a priori*. On the one hand, reducing discretionary expenses increases CFO after controlling for sales. On the other hand, real activities such as price discounts, channel stuffing, and overproduction actually have a negative effect on CFO after controlling for sales. More importantly, prior studies (e.g., Roychowdhury 2006) show that firms that manage earnings through real activities in general have lower unexpected CFO.

unexpected CFO stemming from managerial incentives to manage earnings using accruals. Unexpected accruals represent the difference between actual accruals and the estimated (fitted) normal accruals based on the modified Jones (1991) model.[8] The higher the unexpected accruals, the greater the accruals-based earnings management.

4.1.4 Empirical Results

Table 1 presents descriptive statistics for selected variables used in our empirical model (1) to test our hypotheses H1a and H1b. The mean value of *DEFAULT* is 0.036, indicating that about 3.6% of bond issues default in the sample. The mean and median value of leverage for our sample firms are 0.331 and 0.306, respectively. Return-on assets (*ROA*) exhibit left skewness, indicating the presence of firms who report considerable losses (the mean value of *ROA* of 0.023 is smaller than the median value of 0.031). Moreover, about 2% of the observations report a large loss. The mean value of the natural log of total assets is $9.135 million, and median value is $9.262 million. Moreover, average maturity of bond issues is 15.735 years.

Table 2 presents Pearson correlations among variables. The rating variable is negatively correlated with *UCFO,* providing some preliminary evidence that firms with higher CFO management are more likely to have aggressive bond ratings. The correlations among the control variables are low, as are the correlations between the test variable (*UCFO*) and the control variables, suggesting that multicollinearity between *UCFO* and control variables is not likely to be a significant issue in the multivariate regressions.

[8] Modified Jones (1991) model is estimated in the cross-section by industry (based on two-digit SIC code) in each year with at least 10 observations: *TA*/Assets = λ (1/Assets) + β_1(Δ*Sales* - Δ*AR*)/Assets + β_2(*PPE*/Assets), where *TA* is total accruals, *ΔSALES* is change in sales revenues, ΔAR is the change in accounts receivables, *PPE* is gross property and equipment.

The results of estimating alternative specifications of equation (1) are presented in Panel A of Table 3. In column (1), default in one year is regressed on *IG* (an indicator variable for investment-grade rating), *UCFO*, and an interaction of the two variables. The coefficient on *IG* is negative and significant, implying that investment-grade bonds are less likely to default than those rated noninvestment grade. The coefficient on the interaction term is positive, meaning that the difference between investment-grade and speculative-grade default rates falls with CFO management. In column (2), we add variables to control for firm characteristics and general bond issue features associated with future default risk. The coefficient on *IG X UCFO* remains significant and positive. The economic magnitude of this impact is large. Speculative-grade issues are predicted to be 10.6% more likely to default in one year than investment-grade firms at mean CFO management, but 15.1% more likely with lower quartile of CFO management and only 6.8% more likely at upper quartile of CFO management. To further check robustness of our findings, we control for special bond issue features in column (3) and find similar results. When we further control for unexpected accruals in column (4) to capture firms' incentive to manage earnings, the coefficient on *IG X UCFO* becomes even more statistically significant than its coefficients in models without controlling for earnings management.

In column (5) - (8), we replace *IG* with *RATING* and re-run all the models reported in column (1) - column (4), respectively, to further assess ratings predictability. The coefficients on *RATING X UCFO* are insignificant in columns (5) – (7), but marginally significant in column (8). Overall, the results in panel A of Table 4 suggest

that CFO management leads to impairment of ratings predictability, but this impairment is mainly restricted to investment-grade ratings.

Next, we investigate the cross-sectional effect of CFO management on rating predictability using specification (2) reported in Panel A and including the main effect for the cross-sectional variable along with its interaction with *UCFO*. Panel B of Table 3 presents the results. In column (1), the coefficient on *UCFO X IG X LARGE* is insignificant, but the corresponding coefficient in column (2) is highly significant and positive. These results suggest that the ability of investment-grade ratings to predict future default is mitigated for large issuers, particularly those with high frequency of bond issuance and more CFO management. In columns (5) and (6), we further assess the impact of CFO management on rating predictability using the general rating levels. Recall that higher rating levels reflect ratings closer to default. The negative and significant coefficient on *UCFO X RATING X LARGE* in column (6) suggests that the ability of ratings levels to predict future default is mitigated for large issuers, particularly those with high frequency of bond issuance and with more CFO management. Moreover, the difference between the large and small issuers is significant in terms of economic magnitude (marginal effects). For large issuers, speculative-grade issues are predicted to be 9.4% more likely to default in one year than investment-grade firms at mean CFO management, but 24.6% more likely with the 25^{th} percentile of CFO management, and only 2.4% more likely at the 75^{th} percentile of CFO management. In contrast, for small issuers, speculative-grade issues are predicted to be 11.8% more likely to default in one year than investment-grade firms at the mean value of CFO management, but 10.4% more likely in the 25^{th} percentile of CFO management and 13.6% more likely at the 75^{th}

percentile of CFO management. Taken together, these results suggest that conflict of interest generally dominates reputational concern in the rating process for large issuers.

In columns (3) and (4), regardless of how financial constraints are defined, the coefficients on *UCFO X IG* are highly significant and positive, but the coefficients on *UCFO X IG X CONSTR* are highly significant and negative. These results imply that even though CFO management mitigates the ability of investment-grade ratings to predict future default for low-constraint firms, such an adverse effect of CFO management on rating predictability is actually greatly weakened for firms with high financial constraints. In columns (7) and (8), the impact of CFO management on rating predictability using the general rating levels exhibits results similar to those reported in columns (3) and (4). Additionally, the difference between the highly financially constrained issuers and other issuers is large in economic magnitude. For highly constrained issuers, speculative-grade issues are predicted to be 7.4% more likely to default in one year than investment-grade firms at the mean value of CFO management, but 8.1% more likely at the 25^{th} percentile of CFO management and only 6.7% more likely at the 75^{th} percentile of CFO management. In contrast, for non-highly constrained issuers, speculative-grade issues are predicted to be 26.3% more likely to default in one year than investment-grade firms at the mean value of CFO management, but 121.1% more likely at the 25^{th} percentile of CFO management and 5.2% more likely at the 75^{th} percentile of CFO management. Overall, these results are consistent with the notion that reputational concern dominates conflict of interest in rating process for financially-constrained issuers.

4.2 Test of hypothesis H2a/H2b

4.2.1 Empirical model

To test hypothesis H2a and H2b, which examine the association between CFO management and rating errors, we test the following logit model:

$$TYPE\_I(TYPE\_II) = \alpha_0 + \beta_1 UCFO + \sum_{q=2}^{m} \beta_q (q^{th} Control\ Variables) + \sum Industry + \sum Year + \varepsilon \quad (3)$$

where a Type I (Type II) error is defined as a rating better (worse) than the cutoff for a defaulting (non-defaulting) bond issue, and all other variables are defined in Appendix A.

Following Cheng and Neamtiu (2009), we use the rating score of 17 as the cutoff point on the rating scale.[9] For a sample of issues that have an event of default within 1 year from the rating date, the variable *TYPE_I* takes the value of 1 (0) if a debt issue has a rating better (worse) than the cut-off point. Thus, the variable *TYPE_I* is an indicator variable that takes the value of 1 for missed defaults, and 0 otherwise. Analogously, for a sample of issues that do not have an event of default within 1 year from the rating date, the variable *TYPE_II* takes the value of 1 (0) if a debt issue has a rating worse (better) than the cut-off point. Thus, the variable *TYPE_II* is an indicator variable that takes the value of 1 for false warnings, and 0 otherwise.[10]

If the rating agencies assign too favorable ratings for defaulting bonds issued by issuers with more unexpected cash flows, then we expect a higher frequency of missed defaults (i.e., higher Type I errors) to be associated with more CFO management. By contrast, if the rating agencies avoid too harsh ratings for non-defaulting bonds issued by

[9] To test the sensitivity of our findings to the choice of a cut-off point, we use 14 as an alternative point and find that our inferences remain unchanged.

[10] About 40% of observations in our sample have Type I errors in the bond ratings, whereas only 3.7% of observations have Type II errors, suggesting that bond ratings are far more likely to be too favorable than to be too harsh. Moreover, untabulated correlations indicate that firms with higher *UCFO* are more prone to have Type I errors in bond ratings, but less likely to have Type II errors.

issuers with more CFO management, we expect a decrease in Type II errors for these firms. Thus, in equation (4), we expect $\beta_1 > 0$ under H2b when *TYPE_I* error is the dependent variable and $\beta_1 < 0$ when *TYPE_II* error is the dependent variable.

4.2.2 Empirical results

Panel A of Table 4 presents the logit regression results for Type I and II error analysis. In each of the four specifications with different sets of control variables, the frequency of Type I (Type II) errors increase (decrease) significantly with the level of *UCFO*. Specifically, the coefficients on the *UCFO* variable in columns (1) – (4) are significantly positive (p-value 0.01) for the Type I error regressions, suggesting that higher level of CFO management is associated with higher likelihood of too favorable ratings. The coefficients on the *UCFO* variable are significantly negative (p-value 0.01) for the Type II error regressions in columns (5) - (8), indicating that higher CFO management is associated with fewer too harsh ratings. The economic magnitude of these effects is large. For example, column (2) indicates that moving from the 25th percentile to the 75th percentile of CFO management, the probability of Type I error increases by 28% (from 31.3% to 40%), while column (6) shows that the probability of Type II error decreases by 44% (from 0.9% to 0.5%). Taken together, our findings for Type I and Type II errors indicate that CFO management is associated with more too favorable ratings and fewer too harsh ratings, which point to the dominance of conflict-of-interest over reputation concerns in CRAs' rating process.

Next, we focus on the cross-sectional effect of CFO management on Type I and Type II errors. In Panel B of Table 4, we provide regression results based on the specification in column (2) or column (6) in Panel A with the main effect for the cross-

sectional variable along with its interaction with *UCFO*. Regardless of how we define large issuers, the coefficients on the interaction of *UCFO* with *LARGE1* or with *LARGE2* are not statistically significant for Type I errors, but highly significant and negative for Type II errors. These results imply that the effect of CFO management on one form of upward rating bias, i.e., more too favorable ratings, does not become more pronounced for large issuers, but becomes more pronounced for the other form of upward rating bias, i.e., fewer too harsh ratings. Because the nonlinearity of the logit model makes statistical significance of interactions difficult to interpret, we make inferences by relying on economic significance, which is significantly different between large and small issuers. Moving from the 25^{th} percentile to the 75^{th} percentile of CFO management, the probability of Type I error increases by 146.5% (from 29.4% to 72.4%) for large issuers, whereas the corresponding probability increases by only 23.3% (from 32.1% to 39.5%) for small issuers. In contrast, moving from the 25^{th} percentile to the 75^{th} percentile of CFO management, the probability of Type II error decreases by 70.8% (from 0.15% to 0.04%) for large issuers, whereas the corresponding probability decreases by only 39.5% (from 0.97% to 0.59%) for small issuers. Taken together, these results suggest that strong economic bonding between large issuers and rating agencies greatly incentivize rating agencies to cater to large issuers' preference than to the small issuers.

In columns (5) – (8), for both specifications of financial constraints, we consistently find that the coefficients on the interaction of *UCFO* with *CONSTR1* or with *CONSTR2* are statistically significant and negative for Type I errors, and significantly positive for Type II errors. These results together suggest that ratings are less likely to be too favorable and more likely to be too harsh for issuers that are more financially

constrained. Further, the economic magnitude is also significantly different between highly financially constrained issuers and other issuers. Moving from the 25th to the 75th percentile of CFO management, the probability of Type I error increases by 1.9% (from 31.5% to 32.1%) for highly constrained issuers, whereas the corresponding probability increases by 75.2% (from 22.8% to 39.9%) for other issuers. On the other side, moving from the 25th percentile to the 75th percentile of CFO management, the probability of Type II error decreases by 40% (from 2.07% to 1.24%) for highly constrained issuers, whereas the corresponding probability decreases by 59% (from 0.06% to 0.03%) for other issuers. Overall, the findings are consistent with the view that reputational concerns of rating agencies dominate in the rating process for highly constrained issuers.

4.3 Test of hypotheses H3a and H3b

4.3.1 Empirical model

Given the particular importance of bond ratings at issuance, we focus on the association between initial bond ratings and bond yield spreads at issuance. Specifically, we use the following model to examine the impact of CFO management on bond ratings informativeness as stated in H4a and H4b:

$$YSPREAD = \alpha_0 + \beta_1 UCFO + \beta_2 RTINIT + \beta_3 UCFO \times RTINIT + \sum_{q=4}^{m} \beta_q (q^{th} Control\ Variables) + \sum Industry + \sum Year + \varepsilon \quad (4)$$

where *YSPREAD* is the yield spread to the closest maturity Treasury bond, and *RTINIT* is the numeric ratings at the time of new bond issuance, and all other variables are as defined before. If conflict of interest dominates rating process, then CFO management impairs information content of bond ratings and we expect β_3 to be negative. However, if

reputational concern dominates, CFO management does not impair information content of bond ratings and we expect β_3 to be zero.

4.3.2 Empirical results

Panel A of Table 5 presents the regression results for the information value of credit ratings. In column (1), the coefficient on *RTINT* (initial credit ratings) is positive and significant, confirming that bonds with worse credit ratings trade at higher yields. Moreover, the coefficient on the interaction of *RTINT* and *UCFO* is negative and significant, implying that the association of credit ratings and bond yields is lower when there is more CFO management. This is consistent with the view that CFO management reduces the information content of bond ratings. However, some omitted firm characteristics and issue features may influence the information value of credit ratings as well as CFO management. To address this concern, we follow prior studies and include firm characteristics and general and special issue features as control variables (e.g., Ederington et al.1987; Ziebart and Reiter 1992; Cheng and Neamtiu 2009; Bonsall 2012). The coefficients on the interaction term between *UCFO* and initial ratings remain significant and negative as seen in columns (2) and (3). When we further control for unexpected accruals (*ABACC*) in column (4) to capture firms' incentive to manage earnings, the coefficient on *UCFO* X *RTINIT* continues to be significant and negative. Moreover, the economic magnitude of the impact is high. For instance, going from the 25^{th} percentile to the 75^{th} percentile of *UCFO*, the effective coefficient on ratings in column (2) falls by 5.2%. Overall, the evidence in Panel A of Table 5 is consistent with the argument that ratings become less informative to bond market investors as issuers engage in more CFO management.

To explore how the association between CFO management and rating informativeness varies with issuer features, we first interact *UCFO* × *RTINIT* with *LARGE1* and *LARGE2*, respectively. The results are presented in column (1) and (2) of Panel B of Table 5. Regardless of the specifications for large issuers, the coefficients on the interaction term *UCFO* × *RTINIT* × *LARGE* are insignificant, but the coefficients on *UCFO* × *RTINIT* are significantly negative. These results suggest that rating informativeness is impaired for small issuers that inflate ratings through CFO management, but rating informativeness does not further decline for large issuers, even though rating inflation due to CFO management is even more serious for these issuers. A potential explanation for this finding is that even though CRAs' conflict of interest dominates reputational concerns for large issuers with CFO management, bond investors still exhibit strong demand for bonds issued by large issuers, regardless of objective rating quality, and such demand reduces bond yields and their validity as a benchmark in assessing bond rating quality.

Second, we test the impact of financial constraints on the association between CFO management and ratings informativeness by interacting *CONSTR1* and *CONSTR2* with *UCFO* × *RTINIT*, respectively. Using both specifications for financial constraints, we consistently find that the coefficients on the interaction term *UCFO* × *RTINIT* × *CONSTR* are highly significant and positive, but the coefficients on *UCFO* × *RTINIT* are significantly negative. These results imply that more inflated ratings associated with CFO management for low-constrained firms impair rating informativeness, but the less pronounced ratings inflation for highly-constrained firms mitigates such negative impact of CFO management on rating informativeness. Overall, our results suggest that the

dominance of reputational concern in rating process makes the negative impact of CFO management on rating informativeness less pronounced for more financially-constrained issuers when compared to other issuers.

5. Additional tests

5.1 Mechanism used to manage CFO

Although Lee (2012) has validated the unexpected cash flow as a proxy for CFO management, it is still possible this proxy has some measurement error. Therefore, we re-examine the impact of CFO management on bond rating quality by focusing on a specific mechanism used to manage cash flows from operations, namely, "timing" certain transactions such as delaying payments to suppliers or accelerating collections from customers. A unique feature of this mechanism is that it allows us to capture CFO management activities that increase CFO without affecting earnings.

To measure "timing," we use the change of cash conversion cycle (as captured by the difference between days in accounts receivable and days in accounts payable) from the fourth quarter in year t to the first quarter in year t+1) as a proxy for CFO management. Given the higher effectiveness of the timing strategy for firms with non-December fiscal year end, we focus on these firms and re-estimate models (1), (3), (4), and (5).[11] Untabulated results show that as firms increase CFO through a timing strategy, the likelihood of Type I error increases, the likelihood of Type II error does not change significantly, and bond rating informativeness declines. Moreover, rating predictability does not change significantly as firms increase CFO through a timing strategy. Overall,

[11] Lee (2012) argues that firms' incentive to inflate CFO using timing strategy is stronger for firms with non-December fiscal year-ends. For non-December year-end firms, it is less likely that the fiscal year-end of their customers or suppliers match their own year-end, making them more amenable to ''timing'' the transaction in a favorable way for the firm.

these results indicate that the inferences with respect to our hypotheses generally remain unaltered, suggesting that timing, a channel that firms use to manage bond ratings, leads to lower rating quality.

5.2 Alternative explanation of cash flow shocks

Our measure of unexpected CFO is obtained by comparing realized cash flows to expected cash flows based on the model in Dechow et al. (1998), who develop their model using the economics of the cash flow generation process. An alternative interpretation of our measure of unexpected CFO is that it represents cash flow shocks not captured by the economic model. Under such an interpretation, unexpected CFO, even though transitory, reflects real effects that can lead to more favorable ratings and even lower rating quality. To further address the concern that our results are driven by real cash flow shocks, we conduct two additional tests. First, we correct for any misspecification in expected cash flow model (2) by controlling for current firm performance and redo all our analyses.[12] Untabulated results indicate that as performance-adjusted CFO management increases, the likelihood of Type I error increases and both rating informativeness and rating predictability decline. However, we are unable to detect a significant impact of performance-adjusted CFO on Type II errors. Second, we examine the impact of CFO management on rating quality over a longer horizon using a three-year window. The intuition is that if our results are driven by transitory real shocks (rather than the strategic and intentional CFO management), rating agencies should be able to fix their inappropriate response to transitory real shocks quickly by correcting their ratings and improving rating quality. Accordingly, real cash

[12] Specifically, we use operating income before depreciation as a performance control for two reasons. First, it has a close relationship with CFO. Second, it excludes non-operating income, special item, and other items that are of a more discretionary nature.

flow shocks will not affect rating quality over the longer horizon. But if our results are driven by intentional and strategic CFO management, managers will try to delay the rating reversals in order to achieve the desired benefit. Untabulated results using rating predictability and rating errors over a three-year window indicate that CFO management still reduces credit ratings predictability of debt default, increases the likelihood of missed defaults, and reduces the likelihood of assigning harsh ratings to non-defaulting issues.[13] Overall, the above evidence consistently suggests that the range of adverse impact of CFO management on bond rating quality is not driven by the real cash flow shocks.

5.3 CFO management vs. real earnings management

In our major analyses, we have shown that it is CFO management, not earnings management that contributes to low rating quality consistently. To further affirm the dominant impact of CFO over earnings in influencing credit ratings and accordingly the dominant effect of CFO management on rating quality, we investigate the impact of CFO management over and above real earnings management such as overproduction. Following Rowchowdhury (2006), we construct the measure for overproduction and re-examine whether our results are robust to firms' incentive to manage earnings as reflected in real manipulation activity.[14] Table 6 presents the results. It shows that impact of CFO management on all three dimensions of rating quality still hold consistently and very significantly. In contrast, the coefficients of interest using overproduction measure

[13] But we cannot do similar tests for ratings informativeness using bond yield spreads of new issues.

[14] We did not perform similar tests using discretionary expenses because recent research (e.g., Athanasakou et al. 2011) point to low explanatory power of the models using discretionary expenditures as a proxy for real earnings management. For example, the mean adjusted-R^2 of 0.38 is the lowest for abnormal discretionary expenses model in Roychowdhury (2006) and the highest (0.89) for abnormal production costs.

are not significant at all for both Type I and Type II error, and rating informativeness. But overproduction is associated with low rating predictability. Put together, the evidence again suggests that CFO management, not (real) earnings management, that contributes to low-quality ratings.

5.4 Alternative explanation of lack of competence

Throughout the paper, we assume the CRAs are competent in identifying and adjusting cash flow from operations managed by bond issuers and attribute our results to incentive effects. To further investigate whether rating agencies have the competency in adjusting managed CFO, we use SOX as a semi-natural experiment to test whether the effect of CFO management on bond rating properties differs between pre- and post-SOX period.

Cheng and Neamtiu (2009) argue that the post-SOX (Sarbanes-Oxley) regime subjects CRAs to increased regulatory pressure and investor criticism. Consistent with this argument, they find an improvement in rating accuracy and timeliness in the post-SOX regime. In light of this finding, we examine whether the SOX-related scrutiny limits the adverse effect of CFO management on rating quality. To this end, we follow Cheng and Neamtiu (2009) to define *POST*, and interact *POST* with multiple dimensions of bond rating quality. Specifically, *POST* is defined as 1 (0) for rating changes between July 25, 2002 and December 31, 2005 (January 1, 1996 and July 25, 2002). The results in Table 7 show that in the pre-SOX regime CFO management is positively associated with Type I errors and negatively associated with Type II errors. However, in the post-SOX regime, more CFO management is associated with fewer Type I and Type II errors. Similarly, we find that in pre-SOX period, more CFO management is still associated with

lower rating predictability, whereas more CFO management is associated with improved rating predictability in post-SOX period. Also, column (5) shows that in pre-SOX period, rating informativeness is impaired by CFO management, but not impaired in post-SOX period. In short, the adverse impact of CFO management on multiple dimensions of bond rating quality is driven by rating agencies' perverse incentive stemming from their conflict-of- interest, not lack of competence.

5.5 Firm fixed effects

Since the empirical literature on predicting rating quality is still relatively new, it is possible that our analysis omits from the regressions some determinants of rating quality that are correlated with other independent variables. To mitigate this concern, we re-estimate model (2), (3), and (4) using firm fixed effect model. Since fixed-effect model using non-linear procedure suffers from parameter estimation problems, we run OLS fixed-effect models.[15] The results show that as CFO management increases, rating predictability declines, the likelihood of Type I error increases, the likelihood of Type II error reduces, and rating informativeness declines. Such evidence suggests that our results reported in Section 4 are not driven by correlated omitted time-invariant variables.

6. Conclusions

This paper examines the relation between CFO management and bond rating quality. Firm cash flow analysis is deemed to be an important consideration in credit rating decisions. This emphasis on CFO can create perverse incentives for bond issuers to manage reported cash flows from operations. Whether CFO management will affect

[15] Woodridge (2002) suggests that when estimating the fixed-effects coefficients in a non-linear model such as a logit or probit model, an incidental parameter problem can be introduced. The maximum likelihood estimator in nonlinear panel data models with fixed effects is biased and inconsistent when T, the length of the panel, is small and fixed.

credit ratings and their quality is ex-ante unclear because of several competing views. One view is that credit rating agencies are adept at gathering and processing firm-specific information. Hence, CFO management is posited to have no bearing on credit ratings quality. Additionally, CRAs face reputational considerations wherein it is argued that high quality credit ratings allow them to earn future economic rents. The implication here again is that CFO management will have no bearing on credit ratings quality. A contrary argument notes that rating agencies may not closely scrutinize the reported cash flow numbers of bond issuers because they receive their revenues from bond issuers. As such, credit rating agencies assign aggressive ratings through CFO management, which can impair rating quality. We attempt to empirically sort out these competing views.

Our analysis is based on a sample of U.S. firms issuing bonds from 1994 to 2010. We examine whether CFO management has detrimental effects on multiple dimensions of bond rating quality. We find CFO management lowers ratings predictability, increases the frequency of Type I errors, reduces the frequency of Type II errors, and adversely affects the informativeness of credit ratings. These results also hold after controlling for firms' incentives to manage earnings. Moreover, the results are qualitatively similar when we focus on a specific mechanism that is used to manage cash flows without influencing earnings, namely, timing" certain transactions such as delaying payments to suppliers or accelerating collections from customers. In addition, our results hold using performance-adjusted measure for CFO management and can be extended to rating quality over three-year window. Further, the results are robust to firm-specific time-invariant variables.

We next explore the heterogeneity in the effects of CFO management across firm attributes. We find the effects of CFO management on credit ratings are more pronounced

for large debt issuers than small debt issuers. This is consistent with the argument that rating agencies lower their scrutiny of bond issuers from whom they earn substantial revenues. We also find that the effect of CFO management on credit ratings is less pronounced for highly financially-constrained firms. This finding is consistent with the argument that reputation concerns induce ratings agencies to provide more scrutiny when there is a higher likelihood of default. Overall, our evidence highlights the range of adverse effects of CFO management on the quality of bond ratings. The heterogeneity in this relation across firm attributes points to the trade-off of conflict of interest and reputational considerations faced by credit rating agencies.

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Appendix A: Variable definitions

1. Dependent variables		
DEFAULT	=	An indicator that takes 1 if there is a default event within one year from the rating date, 0 otherwise.
ERROR_I	=	An indicator that takes the value of 1 for missed defaults, and 0 otherwise. Specifically, for a sample of issues that have an event of default within 1 year from the rating date, this variable takes the value 1 (0), if a debt issue has a rating better (worse) than the cut-off point.
ERROR_II	=	An indicator that takes the value of 1 for false warnings, and 0 otherwise. Specifically, for a sample of issues that don't have an event of default 1 year from the rating date, this indicator takes the value of 1 (0), if a issue has a rating worse (better) than the cut-off point.
YSPREAD	=	The difference between a bond's initial yield-to-maturity and the yield on a U.S. Treasury bond with the closest maturity.
2. Test variables		
UCFO	=	The unexpected CFO over the prior fiscal year, where unexpected CFO is the difference between actual and expected CFO, and the expected CFO is estimated by running Dechow et al. (1998) model cross-sectionally for industry-years with at least 10 observations.
3. Control variables		
IG	=	An indicator that takes 1 if the credit ratings are within the investment-grade category, 0 otherwise.
RATING	=	Assigned numeric rating score following Cheng and Neamtiu (2009).
RTINIT	=	The numeric ratings *(RATING)* outstanding for the newly issued bonds
SIZE	=	The natural logarithm of an issuer's total assets.
LEV	=	Long-term debt divided by total assets.
COV	=	Operating income before depreciation divided by interest expense.
ROA	=	Net income before extraordinary items divided by total assets.
LARGE_LOSS	=	An indicator variable that takes a value of 1 if a firm experiences an annual loss equal or greater than 25% of total assets, 0 otherwise.
NET_RET	=	An indicator variable that takes a value of 1 if a firm reports negative retained earnings and 0 otherwise.
SENIOR	=	A binary variable set equal to one if a bond has seniority status and zero otherwise.
SECURE	=	A binary variable set equal to one if a bond is secured with collateral and zero otherwise.
ISSUESIZE	=	The natual logarithm of the face value of the bond issue.
MATURITY	=	Time until the maturity of the bond in years.
ASSETB	=	An indicator variable that takes a value of 1 if the issue is an

		asset-based, 0 otherwise.
CONV	=	An indicator variable that takes a value of 1 if the issue can be converted to the common stock of the issuer, 0 otherwise.
ENHANCE	=	An indicator variable that takes a value of 1 if the issue has the credit enhancement feature, 0 otherwise.
PUT	=	An indicator variable that takes a value of 1 if the issue has the option, but not the obiligation, to sell the security back to the issuer under certain circumstances, 0 otherwise.
REDEEM	=	An indicator variable that takes a value of 1 if the issue is redeemable under certain circumstances, 0 otherwise.

4. Partitioning variables

LARGE1	=	An indicator variable that takes 1 if both the total face value issued and the number of bond issues are above the sample median and 0 otherwise.
LARGE2	=	An indicator variable that takes 1 if the number of bond issues is above the sample median and 0 otherwise.
CONSTR1	=	The *SAINDEX* defined as below following Hadlock et al. 2010: (-0.737* Size) + (0.043*Size^2)-(0.040*Age), where size is the log of book assets, and age is the number of years the firm has been on Compustat with a non-missing stock price. In calculating this index, size is replaced with log($4.5 billion) and age with thirty-seven years if the actual values exceed these thresholds.
CONSTR2	=	The *SAINDEX* defined as below following Hadlock et al. 2010: (-0.737* Size) + (0.043*Size^2)-(0.040*Age), where size is the log of book assets, and age is the number of years the firm has been on Compustat with a non-missing fiscal year. In calculating this index, size is replaced with log($4.5 billion) and age with thirty-seven years if the actual values exceed these thresholds.

Appendix B: Rating schemes definitions

Credit risk	Moody's	Standard & Poor's	Fitch's	Code assigned
Highest grade	Aaa	AAA	AAA	1
	Aa1	AA+	AA+	2
High grade	Aa2	AA	AA	3
	Aa3	AA-	AA-	4
	A1	A+	A+	5
Upper medium grade	A2	A	A	6
	A3	A-	A-	7
	Baa1	BBB+	BBB+	8
Medium grade	Baa2	BBB	BBB	9
	Baa3	BBB-	BBB-	10
	Ba1	BB+	BB+	11
Lower medium grade	Ba2	BB	BB	12
	Ba3	BB-	BB-	13
	B1	B+	B+	14
Low grade	B2	B	B	15
	B3	B-	B-	16
	Caa1	CCC+	CCC+	17
	Caa2	CCC	CCC	18
	Caa3	CCC-	CCC-	19
	Ca	CC	CC	20
	C	C	C	21
Default		D	DDD/DD/D	22

Table 1 Descriptive statistics

This table presents descriptive statistics for CFO management, bond credit ratings, and control variables. The sample period is from fiscal year 1995 to 2010. All variables are defined in Appendix A.

	N	Mean	Std	5%	25%	Median	75%	95%
Dependent variable								
DEFAULT	93736	0.036	0.187	0.000	0.000	0.000	0.000	0.000
Test variable								
UCFO	93736	0.029	0.097	-0.095	-0.021	0.023	0.074	0.177
Control variables								
Firm characteristics								
SIZE	93736	8.992	1.518	6.406	7.967	9.145	9.975	11.515
LEV	93736	0.331	0.173	0.097	0.211	0.307	0.418	0.662
COV	93736	6.779	8.007	0.369	2.743	4.597	7.964	19.899
ROA	93736	0.024	0.081	-0.135	0.005	0.033	0.065	0.126
Issue characteristics								
RATING	93736	10.506	4.131	5.000	8.000	10.000	14.000	18.000
ISSUESIZE	93736	12.360	1.238	10.820	11.918	12.429	13.050	13.816
MATURITY	93736	14.994	12.211	4.723	7.910	10.025	20.027	30.068
SENIOR	93736	0.787	0.409	0.000	1.000	1.000	1.000	1.000
SECURE	93736	0.053	0.224	0.000	0.000	0.000	0.000	1.000
ASSETB	93736	0.035	0.183	0.000	0.000	0.000	0.000	0.000
CONV	93736	0.080	0.271	0.000	0.000	0.000	0.000	1.000
ENHANCE	93736	0.131	0.337	0.000	0.000	0.000	0.000	1.000
PUT	93736	0.066	0.249	0.000	0.000	0.000	0.000	1.000
REDEEM	93736	0.693	0.461	0.000	0.000	1.000	1.000	1.000

Table 2 Pearson Correlations

This table presents Pearson correlations. The sample period is from fiscal year 1995 to 2010. All variables are defined in Appendix A. p-values are reported in parentheses.

		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
RATING	A	1.000														
UCFO	B	-0.263	1.000													
		(0.000)														
SIZE	C	-0.371	0.128	1.000												
		(0.000)	(0.000)													
LEV	D	0.528	-0.166	-0.326	1.000											
		(0.000)	(0.000)	(0.000)												
COV	E	-0.433	0.314	0.123	-0.512	1.000										
		(0.000)	(0.000)	(0.000)	(0.000)											
ROA	F	-0.512	0.271	0.119	-0.395	0.514	1.000									
		(0.000)	(0.000)	(0.000)	(0.000)	(0.000)										
ISSUESIZE	G	-0.019	0.101	0.267	0.042	0.049	-0.012	1.000								
		(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)									
MATURITY	H	-0.193	0.006	0.255	-0.154	0.055	0.070	-0.032	1.000							
		(0.000)	(0.114)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)								
SENIOR	I	-0.238	0.099	0.299	-0.170	0.117	0.087	0.410	0.097	1.000						
		(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)							
SECURE	J	-0.073	-0.078	-0.099	0.066	-0.081	-0.012	-0.105	-0.001	-0.442	1.000					
		(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.802)	(0.000)						
ASSETB	K	-0.000	-0.064	0.060	-0.093	0.014	-0.013	-0.671	0.003	-0.415	-0.047	1.000				
		(0.984)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.483)	(0.000)	(0.000)					
CONV	L	0.211	-0.013	-0.119	0.057	-0.015	-0.084	0.090	-0.038	-0.200	-0.059	-0.059	1.000			
		(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)				
ENHANCE	M	0.216	-0.059	-0.196	0.168	-0.103	-0.066	0.050	-0.132	-0.118	0.034	-0.077	-0.043	1.000		
		(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)			
PUT	N	0.015	-0.003	0.016	-0.043	0.034	0.001	0.082	0.171	0.037	-0.043	-0.057	0.427	-0.039	1.000	
		(0.000)	(0.417)	(0.000)	(0.000)	(0.000)	(0.695)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)		
REDEEM	O	0.250	-0.037	-0.202	0.171	-0.047	-0.083	0.087	-0.067	-0.194	0.042	0.049	0.103	0.195	0.033	1.000
		(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	

Table 3 Bond rating predictability in terms of default

This table presents logit regressions to test the impact of CFO management on the ability of credit ratings to forecast the occurrence of default in one year. The sample period is from fiscal year 1994 to 2010. All variables are defined in Appendix A. Standard errors for the coefficient estimates are heteroskedasticity-robust and clustered by firm. *Z* statistics are reported in parentheses. Industry and year fixed effects are included in all regressions. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Significance levels are based on two-tailed tests.

Panel A: Base model

	Pred.sign	Dependent variable: *DEFAULT*							
		RATE=IG				*RATE=RATING*			
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
UCFO	*?*	-2.887***	-1.541**	-1.554**	-1.780*	10.78	10.342	10.535	15.475
		(-3.24)	(-2.08)	(-2.09)	(-1.75)	(1.18)	(1.18)	(1.22)	(1.61)
RATE	-/+	-3.080***	-2.644***	-2.631***	-2.741***	0.459***	0.473***	0.485***	0.466***
		(-9.18)	(-9.03)	(-8.99)	(-7.29)	(12.21)	(13.00)	(12.03)	(10.09)
RATE × UCFO	***?***	**8.307****	**7.614****	**7.597****	**11.452*****	**-0.713**	**-0.688**	**-0.698**	**-1.000***
		(2.36)	**(1.98)**	**(1.97)**	**(2.86)**	**(-1.29)**	**(-1.28)**	**(-1.30)**	**(-1.69)**
SIZE	-		0.151	0.188	0.264*		0.280**	0.282**	0.345***
			(1.15)	(1.40)	(1.79)		(2.41)	(2.21)	(2.59)
LEV	+		-0.151	-0.135	-0.627		-0.955	-1.064	-1.360*
			(-0.21)	(-0.19)	(-0.78)		(-1.39)	(-1.57)	(-1.74)
COV	-		-0.087	-0.086	-0.105*		-0.037	-0.036	-0.052
			(-1.37)	(-1.38)	(-1.71)		(-0.79)	(-0.78)	(-0.97)
ROA	-		-5.003***	-5.120***	-5.459***		-1.932*	-1.851	-2.321
			(-3.89)	(-3.99)	(-3.64)		(-1.73)	(-1.64)	(-1.51)
ISSUESIZE	*?*		0.019	-0.057	-0.027		-0.003	0.064	0.093
			(0.17)	(-0.40)	(-0.17)		(-0.04)	(0.40)	(0.58)

MATURITY	+		-0.012	-0.014	-0.012		-0.013	-0.011	-0.013
			(-1.24)	(-1.32)	(-1.08)		(-1.32)	(-1.06)	(-1.21)
SENIOR	-		-0.006	-0.091	-0.249		0.243	0.34	0.165
			(-0.04)	(-0.49)	(-1.18)		(1.39)	(1.63)	(0.67)
SECURE	-			-0.066	-0.131			0.670**	0.486
				(-0.20)	(-0.35)			(2.12)	(1.28)
ASSETB	?			-0.968	-1.154			0.703	0.494
				(-1.18)	(-1.33)			(0.68)	(0.46)
CONV	-			-0.149	-0.336			-0.358	-0.546**
				(-0.61)	(-1.19)			(-1.51)	(-2.06)
ENHANCE	-			-0.152	0.045			0.121	0.306
				(-0.67)	(0.20)			(0.55)	(1.33)
PUT	-			-0.018	-0.078			-0.044	-0.129
				(-0.08)	(-0.29)			(-0.18)	(-0.48)
REDEEM	-			0.197	0.115			0.135	0.096
				(1.12)	(0.63)			(0.69)	(0.47)
ABACC	?				0.713*				-2.497
					(1.71)				(-0.96)
ABACC × RATE	?				-3.595**				0.164
					(-2.28)				(1.06)
Constant		-3.318***	-4.019**	-3.399	-3.981	-10.220***	-12.180***	-13.418***	-13.701***
		(-4.19)	(-2.04)	(-1.56)	(-1.51)	(-12.44)	(-6.61)	(-5.79)	(-5.18)
N		93736	93736	93736	61915	93736	93736	93736	61915
Pseudo R^2		0.248	0.297	0.298	0.316	0.405	0.425	0.428	0.429

Panel B: Cross-sectional tests – impact of large issuers and financial constraints

	Dependent variable: *DEFAULT*							
	RATE=IG				*RATE=RATING*			
	LARGE=		*CONSTR=*		*LARGE=*		*CONSTR=*	
	LARGE1	*LARGE2*	*CONSTR1*	*CONSTR2*	*LARGE1*	*LARGE2*	*CONSTR1*	*CONSTR2*
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
UCFO	-1.344**	-1.163*	-3.773	-4.307	8.687	-9.383***	23.165**	23.796**
	(-2.01)	(-1.88)	(-1.08)	(-1.23)	(0.87)	(-2.76)	(2.42)	(2.44)
RATE	-2.394***	-2.751***	-3.147***	-3.323***	0.498***	0.594***	0.440***	0.444***
	(-7.29)	(-5.76)	(-6.72)	(-6.46)	(9.98)	(12.37)	(9.13)	(8.96)
UCFO× RATE	6.445	-2.183	16.889***	18.108***	-0.571	0.483***	-1.758***	-1.834***
	(1.59)	(-0.82)	(4.33)	(4.88)	(-0.94)	(2.59)	(-2.66)	(-2.80)
LARGE	-0.357	-0.749*			-0.057	0.911		
	(-1.12)	(-1.82)			(-0.05)	(0.75)		
UCFO × LARGE	-4.086	-3.14			7.696	35.037***		
	(-0.72)	(-0.76)			(0.90)	(4.69)		
LARGE × RATE	-1.029	-0.261			-0.045	-0.137**		
	(-1.58)	(-0.39)			(-0.65)	(-1.98)		
UCFO × RATE × LARGE	**8.293**	**18.999*** **			**-0.699**	**-2.402*** **		
	(1.39)	**(3.72)**			**(-1.34)**	**(-4.37)**		
CONSTR			0.587	0.682			-0.675	-0.249
			(1.28)	(1.43)			(-0.42)	(-0.16)
UCFO × CONSTR			2.272	2.767			-26.674**	-26.404**
			(0.63)	(0.76)			(-2.16)	(-2.18)
CONSTR× RATE			0.71	1.061			0.104	0.09
			(0.99)	(1.46)			(1.17)	(1.04)
UCFO × RATE × CONSTR			**-15.693*** **	**-16.837*** **			**1.886** **	**1.907** **
			(-3.85)	**(-4.35)**			**(2.42)**	**(2.53)**
Controls	YES	YES	YES	YES	YES	YES	YES	YES
N	93736	93736	93736	93736	93736	93736	93736	93736
Pseudo R^2	0.301	0.31	0.304	0.305	0.432	0.457	0.441	0.442

Table 4 Predicting Type I and Type II errors in bond ratings

This table presents logit regressions to test the impact of CFO management on the errors of bond credit ratings. The sample period is from fiscal year 1994 to 2010. All variables are defined in Appendix A. Standard errors for the coefficient estimates are heteroskedasticity-robust and clustered by firm. *Z* statistics are reported in parentheses. Industry and year fixed effects are included in all regressions. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Significance levels are based on two-tailed tests.

Panel A: Base model

	Dependent variable: *TYPE_I*					Dependent variable: *TYPE_II*				
	Pred. sign	(1)	(2)	(3)	(4)	Pred. sign	(5)	(6)	(7)	(8)
UCFO	***?***	**3.010*****	**2.373*****	**1.626****	**2.723*****	***?***	**-7.743*****	**-6.032*****	**-4.631*****	**-5.474*****
		(3.42)	**(3.03)**	**(2.15)**	**(2.98)**		**(-8.20)**	**(-6.15)**	**(-5.47)**	**(-4.07)**
SIZE	+		0.237**	0.218*	0.222	-		-0.201**	-0.109	-0.029
			(2.18)	(1.95)	(1.53)			(-2.38)	(-1.14)	(-0.25)
LEV	-		-2.024***	-1.328*	-1.431*	+		6.314***	4.412***	4.296***
			(-2.66)	(-1.90)	(-1.65)			(8.58)	(7.89)	(6.51)
ISSUESIZE	*?*		0.017	0.209**	0.169*	*?*		-0.112	-0.324***	-0.405***
			(0.20)	(2.36)	(1.72)			(-1.22)	(-4.77)	(-3.92)
MATURITY	-		0.002	0.009	0.012*	+		0.005	0.007	0.008
			(0.27)	(1.52)	(1.89)			(0.62)	(1.02)	(1.23)
SENIOR	+		0.686***	0.935***	0.926***	-		-0.634***	-0.717***	-0.591**
			(2.65)	(4.56)	(4.24)			(-3.24)	(-3.58)	(-2.54)
SECURE	+		1.716***	2.268***	2.652***	-		-1.907***	-1.941***	-1.993***
			(3.50)	(5.07)	(5.04)			(-4.13)	(-4.00)	(-3.52)
LARGE_LOSS	-			-1.891***	-2.046***	+			1.089***	0.374

				(-3.35)	(-3.05)				(3.70)	(1.03)
NET_RET	-			-0.806***	-0.711*	+			1.966***	2.027***
				(-2.99)	(-1.93)				(5.31)	(4.41)
ASSETB	*?*			3.851***	4.242***	*?*			-1.580***	-2.253***
				(4.74)	(4.78)				(-2.91)	(-3.62)
CONV	+			-0.043	0.097	-			1.202***	1.396***
				(-0.15)	(0.29)				(6.19)	(6.70)
ENHANCE	+			-0.099	-0.342	-			-0.28	-0.412
				(-0.34)	(-1.01)				(-1.22)	(-1.36)
PUT	+			-0.439	-0.263	-			-0.543**	-0.739**
				(-1.64)	(-0.89)				(-1.99)	(-2.43)
REDEEM	+			-0.317	-0.317	-			-0.078	-0.011
				(-1.26)	(-1.29)				(-0.57)	(-0.08)
ABACC	*?*				0.851	*?*				-0.681
					(1.34)					(-1.32)
Constant		-1.861**	-3.796***	-5.374***	-4.854***		-5.416***	-3.700*	-2.128	-1.878
		(-2.29)	(-2.88)	(-3.72)	(-2.88)		(-9.61)	(-1.95)	(-1.35)	(-0.99)
N		3236	3236	3054	2480		91844	91844	90127	57366
Pseudo R^2		0.183	0.243	0.294	0.302		0.19	0.353	0.434	0.432

Panel B: Cross-sectional tests – impact of large issuers and financial constraints

	Dependent variable=							
	TYPE_I		*TYPE_II*		*TYPE_I*		*TYPE_II*	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
UCFO	2.399***	2.561***	-5.317***	-4.736***	3.390***	3.494***	-10.308***	-9.771***
	(2.96)	(2.96)	(-5.63)	(-5.18)	(3.79)	(4.04)	(-5.44)	(-5.31)
LARGE1	0.322		0.510*					
	(0.89)		(1.74)					
LARGE2		1.197*		0.695*				
		(1.92)		(1.86)				
LARGE1×UCFO	**2.333**		**-5.514****					
	(0.51)		**(-2.51)**					
LARGE2×UCFO		**1.354**		**-5.979****				
		(0.29)		**(-2.49)**				
CONSTR1					-0.147		0.43	
					(-0.36)		(1.22)	
CONSTR2						-0.082		0.411
						(-0.21)		(1.14)
CONSTR1×UCFO					**-2.180***		**5.021****	
					(-1.87)		**(2.35)**	
CONSTR2×UCFO						**-2.265****		**4.380****
						(-1.96)		**(2.09)**
Controls	YES	YES	YES	YES	YES	YES	YES	YES
N	3236	3236	91844	91844	3236	3236	91844	91844
Pseudo R^2	0.244	0.252	0.358	0.362	0.246	0.246	0.356	0.356

Table 5 Bond rating informativeness in terms of bond yield spread

This table presents OLS regressions to test the impact of CFO management on bond rating informativeness, i.e., the association between bond ratings and bond yield spread. The sample period is from fiscal year 1994 to 2010. All variables are defined in Appendix A. Standard errors for the coefficient estimates are heteroskedasticity-robust and clustered by firm. *T* statistics are reported in parentheses. Industry and year fixed effects are included in all regressions. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Significance levels are based on two-tailed tests.

Panel A: Base model

	Pred.sign	*YSPREAD*			
		(1)	(2)	(3)	(4)
UCFO	*?*	2.350***	2.176***	2.131***	2.896***
		(4.00)	(3.68)	(3.55)	(3.62)
RTINIT	+	0.401***	0.372***	0.376***	0.415***
		(44.58)	(26.23)	(26.47)	(24.16)
UCFO× RTINIT	***?***	**-0.301*** **	**-0.244*** **	**-0.242*** **	**-0.313*** **
		(-5.63)	**(-4.78)**	**(-4.67)**	**(-4.44)**
SIZE	-		-0.117***	-0.116***	-0.082**
			(-4.33)	(-4.25)	(-2.38)
LEV	+		-0.542***	-0.562***	-0.619***
			(-2.90)	(-3.00)	(-2.76)
COV	-		0.002	0.002	0.000
			(0.87)	(0.74)	(-0.15)
ROA	-		-1.900***	-1.881***	-1.231***
			(-5.38)	(-5.35)	(-2.95)
ISSUESIZE	*?*		0.075*	0.085**	0.063
			(1.89)	(2.06)	(1.24)
MATURITY	+		0.007***	0.008***	0.008***
			(5.75)	(6.39)	(4.98)
SENIOR	*?*		0.098	0.111	0.187**
			(1.28)	(1.45)	(1.98)
SECURE	-		1.322***	1.343***	1.458***
			(5.92)	(6.06)	(5.05)
ASSETB	*?*			0.890***	1.059***
				(5.85)	(5.25)
CONV	-			-4.046***	-4.047***
				(-24.07)	(-17.88)
ENHANCE	-			-0.263***	-0.320***

				(-3.08)	(-3.01)
PUT	-			-0.294***	-0.300**
				(-2.87)	(-2.21)
REDEEM	-			-0.018	-0.11
				(-0.34)	(-1.44)
ABACC	*?*				0.524
					(1.52)
ABACC × RTINIT	*?*				-0.041
					(-1.20)
Constant		0.653***	-1.742***	-2.013***	-2.306***
		-3.35	(-3.52)	(-4.18)	(-3.64)
N		4308	4308	4308	2865
R2_adj		0.663	0.684	0.687	0.694

Panel B: Cross-sectional tests – impact of large issuers and financial constraints

	Dependent variable: *YSPREAD*			
	LARGE=		*CONSTR=*	
	LARGE1	*LARGE2*	*CONSTR1*	*CONSTR2*
	(1)	(2)	(3)	(4)
UCFO	1.999***	1.371*	4.065***	3.712***
	(3.06)	(1.82)	(3.75)	(3.65)
RTINIT	0.393***	0.415***	0.308***	0.298***
	(30.09)	(31.40)	(12.96)	(13.34)
UCFO× RTINIT	-0.223***	-0.181***	-0.656***	-0.615***
	(-4.03)	(-2.91)	(-4.31)	(-4.22)
LARGE	0.454*	0.832***		
	(1.87)	(4.06)		
UCFO × LARGE	0.377	0.409		
	(0.28)	(0.31)		
LARGE × RTINIT	-0.059**	-0.101***		
	(-2.32)	(-4.60)		
UCFO × RTINIT × LARGE	**-0.107**	**-0.031**		
	(-0.67)	**(-0.20)**		
CONSTR			-1.025***	-1.153***
			(-4.58)	(-5.40)
UCFO × CONSTR			-3.079**	-2.586**
			(-2.40)	(-2.13)
CONSTR × RTINIT			0.107***	0.124***
			(4.06)	(4.97)
UCFO × RTINIT × CONSTR			**0.517*** **	**0.465*** **
			(3.16)	**(2.95)**
Controls	YES	YES	YES	YES
N	4308	4308	4308	4308
Adj. R^2	0.686	0.69	0.693	0.695

Table 6 CFO management, real earnings management, and bond rating quality

This table presents regression results to test the impact of CFO management on bond rating quality after controlling for real earnings management such as overproduction. The sample period is from fiscal year 1994 to 2010. All variables are defined in Appendix A. Standard errors for the coefficient estimates are heteroskedasticity-robust and clustered by firm. *T (Z)* statistics are reported in parentheses. Industry and year fixed effects are included in all regressions. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Significance levels are based on two-tailed tests.

	Dependent variable=				
	TYPE_I	*TYPE_II*	*DEFAULT IG*	*DEFAULT RATE= RATING*	*YSPREAD RTINIT*
	(2)	(3)	(4)	(5)	(6)
UCFO	**2.593*** **	**-5.535*** **	-1.057	11.952**	1.972***
	(3.21)	**(-4.72)**	(-1.27)	(2.33)	(3.17)
RATE			-3.311***	0.523***	0.373***
			(-6.88)	(12.80)	(25.37)
UCFO×RATE			**7.803*** **	**-0.770** **	**-0.237*** **
			(3.67)	**(-2.40)**	**(-4.13)**
OVERPROD	**-0.393**	**0.713**	1.053*	11.531***	-0.428
	(-0.52)	**(1.38)**	(1.78)	(2.82)	(-1.24)
OVERPROD×RATE			**5.898*** **	**-0.644** **	**0.051**
			(3.80)	**(-2.53)**	**(1.50)**
Controls	Yes	Yes	Yes	Yes	Yes
N	3127	88593	90312	90312	2865
Pseudo/Adj. R^2	0.248	0.357	0.328	0.449	0.69

Table 7 Relation between CFO management and bond rating quality: pre- and post-Sarbanes-Oxley Act

This table presents regression results to test whether the impact of CFO management on bond rating quality differs between pre- and post-Sarbanes-Oxley Act. The sample period is from 1996 to 2005. All variables are defined in Appendix A. Standard errors for the coefficient estimates are heteroskedasticity-robust and clustered by firm. *Z* statistics are reported in parentheses. Industry and year fixed effects are included in all regressions. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Significance levels are based on two-tailed tests.

	Dependent variable=				
	TYPE_I	*TYPE_II*	*DEFAULT*		*YSPREAD*
			IG	*RATE= RATING*	*RTINIT*
	(1)	(2)	(3)	(4)	(5)
UCFO	2.831***	-2.171**	-0.696	11.79	2.657***
	(2.90)	(-2.33)	(-1.21)	(1.42)	(4.30)
RATE			-2.438***	0.459***	0.351***
			(-7.58)	(9.65)	(22.11)
UCFO×RATE			**7.499****	**-0.734**	**-0.251*****
			(2.03)	**(-1.46)**	**(-4.65)**
POST	0.12	0.884***	-0.364	-2.121	0.562**
	(0.15)	(2.60)	(-0.54)	(-1.54)	(2.58)
UCFO×POST	**-10.224****	**-8.248*****	-6.785**	-52.796***	-0.932
	(-2.29)	**(-2.95)**	(-2.53)	(-4.46)	(-0.73)
POST×RATE			-1.918***	0.091	-0.052**
			(-3.05)	(1.22)	(-2.57)
UCFO×RATE×POST			**-25.152*****	**2.818*****	**0.038**
			(-4.83)	**(3.93)**	**(0.29)**
Controls	Yes	Yes	Yes	Yes	Yes
N	2699	62523	64187	64187	2688
Pseudo/Adj. R^2	0.23	0.356	0.29	0.408	0.668