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Xia (Eliza) Zhang
University of Washington Tacoma
zhang20@uw.edu

Running Head: Do firms manage their credit ratings? Evidence from rating-based contracts

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ABSTRACT

This paper examines whether firms with rating-based performance-priced loan contracts (PPrating firms) manage cash flow from operations (CFO) and accruals to obtain better firm credit ratings. I find that for PPrating firms, both CFO management and accruals management are positively associated with firm credit ratings. In the cross-section, the relation of CFO management and accruals management with firm ratings is less pronounced when there is a larger benefit associated with inflated firm ratings. These results support the view that financial statement manipulation helps PPrating firms achieve more favorable ratings; when these firms are subject to more stringent rating-agency monitoring, such manipulation proves less effective.

Keywords: rating-based debt contracting; cash flow management; accruals management; firm credit ratings.

JEL classification: G18, G20, G28

INTRODUCTION

Credit rating-based performance pricing provisions have been increasingly used in private loan contracts (Beatty and Weber 2003; Asquith, Beatty, and Weber 2005). If a firm's credit rating is upgraded, the interest rate charged on a loan decreases. Conversely, if a firm's credit rating is downgraded, the interest rate charged on a loan increases. Asquith et al. (2005) find that interest rates increase by 13.8 basis points on average for each step in the pricing grid. Such potential for substantial interest rate movement and significant debt cost savings give borrowers strong incentive to influence their ratings (Kraft 2015). Yet, little is known about the implications of rating-based contracts on credit-rating management. To fill the void in the literature, I examine whether firms with rating-based performance pricing provisions (PPrating firms) manage cash flow from operations (CFO management) as well as accruals to influence their firm ratings.[1]

My investigation of CFO management is motivated by the importance of cash flow analysis in rating decisions as well as growing attention placed on CFO. Credit rating agencies (CRAs) emphasize cash flow analysis as one of the most critical aspect of rating decision making, because they believe debt is serviced out of cash and cash flows cannot be easily managed (Standard and Poor's 2008). An increasingly large number of analysts and firms issue cash flow forecasts (DeFond and Hung 2003; Wasley and Wu 2006; Call, Chen, and Tong 2013; Mohanram 2014), and business media mention "cash flow reigns once again", particularly during uncertain times (Lauricella 2008). But many prior studies (e.g., Dechow, Kothari, and Watts 1998; Badertscher, Collins, and Lys 2012) take reported CFO as given and there is limited

[1] Similar to Lee (2012), I define CFO management as managerial use of their discretion over real transactions or financial reporting to inflate cash flow from operations.

research on CFO management, though cases of cash flow misreporting abound.[2] Further, numerous accounting textbooks and investment advisors recommend using CFO as a benchmark to evaluate earnings quality.[3] If CRAs similarly rely on CFO, CFO management could lead to inflated ratings, potentially impairing the contracting value of firm ratings and, thereby, proper functioning of the financial system due to the centrality of ratings (e.g., Becker and Milbourn 2011).

The investigation of accruals management is spurred by recent research on the relation between accruals management and credit ratings. For instance, Caton, Chiyachantana, and Chua (2011) find that although issuers engage in accruals-based earnings management surrounding seasoned bond offerings, accruals management contributes to lower credit ratings. In a different setting, Alissa, Bonsall, Koharki, and Penn (2013) show that accruals management helps firms achieve a target rating level. If accruals management also influences ratings for PPrating firms, the contracting value of firm ratings could be hurt; hence, it is important to understand whether PPrating firms use accruals management to achieve their desired ratings.

Since interest rates are tied to firm ratings for PPrating firms, managers of these firms have incentives to manage CFO and accruals with an eye toward influencing their ratings. They could manage CFO because CRAs emphasize the importance of cash flow adequacy to rating decisions (S&P's 2008). PPrating firms could also manage accruals to achieve their preferred ratings because inflated accruals can lead to higher earnings, which CRAs also consider in rating decisions. In short, PPrating firms have incentives to maintain or improve firm ratings through

[2] For example, during the four quarters of 2001 and the first quarter of 2002, WorldCom overstated cash flow by $3.8 billion by misreporting operating costs such as basic network maintenance as capital investments (Romero and Berenson 2002). Recently, Deloitte & Touche LLP point out that "errors in the statement of cash flows continue to be one of the leading causes of restatements and companies continue to receive comments from the SEC's staff on cash flow presentation matters." (Deloitte & Touche LLP 2017, vi)

[3] See articles by Fink (2000), Glassman (2002), Henry (2004), and Lauricella (2008), and books by Schilit (2002), Wild, Subramanyam, and Hasley (2004), R. Libby, P. Libby, and Short (2008), and Dyckman, Magee, and Pfeiffer (2011).

CFO/accruals management because the interest rate charged on a loan decreases as credit ratings improve.

However, it is unclear *ex ante* whether managers of PPrating firms influence ratings through CFO management and accruals management. First, both CFO management and accruals management incur costs to the firm, such as diverting managerial attention and efforts to improve firm value. Second, managers of PPrating firms face constraints in managing CFO and accruals. For instance, they may not have the accounting flexibility to manage accruals to a magnitude significant enough to impact firm ratings. Third, since CRAs are sophisticated at collecting and processing information, they should be able to adjust managed CFO and accruals in assessing a firm's credit profile; reputational concerns may also give CRAs incentives to undo CFO/accruals management. Therefore, it remains an empirical question whether PPrating firms use CFO/accruals management to obtain more favorable firm ratings.

To test the relation between CFO/accruals management and ratings, I follow Becker and Milbourn (2011) and use long-term issuer credit ratings as assigned by Standard & Poor's (S&P) to measure firm ratings. Similar to Lee (2012), I measure CFO management using performance-adjusted unexpected CFO estimated based on a modified Dechow et al. (1998) model. The unexpected CFO captures two types of CFO management. One type affects both CFO and earnings. For example, a reduction in discretionary expenses increases both CFO and earnings (Dechow and Sloan 1991; Roychowdhury 2006). The other type affects CFO but not earnings. For instance, firms can inflate CFO by shifting items among cash-flow-statement categories or by accelerating collections from customers and delaying payments to suppliers. Since my research interest is in the overall effect of CFO management, I do not distinguish between the two types, but focus instead on their overall effect on ratings in the main analysis. I measure

accruals management using performance-adjusted abnormal accruals estimated based on a modified Jones (1991) model.

Using a sample of U.S. firms with rating-based performance pricing provisions from 1994 through 2011, I document the following results. First, I find a positive association between CFO management and future firm ratings. Since I cannot draw meaningful inferences from my results without a valid measure for CFO management, I conduct tests to confirm the validity of the CFO management measure. I find that my metric captures the underlying construct of CFO management. I also find a positive association between accruals management and future ratings. These results are robust to a battery of sensitivity analyses. Overall, my results suggest that financial statement manipulation helps PPrating firms achieve better ratings.

To further understand the relation between CFO/accruals management and firm ratings for PPrating firms, I next evaluate how the CFO/accruals management–rating relation varies with the benefit of inflating ratings. Although managers of PPrating firms have stronger incentive to inflate their ratings through CFO/accruals management when a larger benefit is associated with inflated ratings, CRAs could well understand such incentive and the amplified information risk, given their knowledge about the contractual use of firm ratings (Moody's 2001; S&P's 2008). Therefore, CRAs could impose more scrutiny in this scenario, which could lead to a less pronounced association between CFO/accruals management and ratings. The results are consistent with this conjecture, suggesting that when PPrating firms are subject to more stringent CRA monitoring, their CFO management and accruals management prove less effective.

Overall, this paper contributes to the literature in several ways. First, this study extends the emerging literature on the mechanisms of credit-rating management. Prior studies show that managers either adjust real activities or massage accounting numbers to influence firm ratings.

For instance, Alissa et al. (2013) find that earnings management helps firms with ratings below (above) the expected ratings move their ratings upward (downward) toward the expected ratings, while Caton et al. (2011) find that earnings management surrounding seasoned bond offerings does not effectively mislead CRAs. This study also examines the rating management through managerial discretion over reported numbers, but it differs from these two studies in that the rating management in this study stems from the contracting role of firm ratings, which has received little attention in the literature. Moreover, CRAs could react differently to the rating management in this setting due to their awareness of the contractual use of firm ratings. Indeed, this study finds that managerial discretion over reported numbers leads to more favorable firm ratings for PPrating firms, suggesting that CRAs do not fully adjust the rating management for these firms. However, CRAs are to some extent cautious about the managerial opportunistic attempt to influence ratings in this setting - they impose more scrutiny when PPrating firms have a stronger incentive to inflate ratings, i.e., when there is a large benefit associated with inflated ratings.[4]

Second, this study contributes to the growing research examining the forces that shape firm ratings. For example, Skreta and Veldkamp (2009) point to asset complexity as a driver of rating inflation. Separately, White (2010) argues that the emphasis placed on credit ratings by financial regulations creates incentives for firms to manage their credit ratings upward. Becker and Milbourn (2011) find that competition among CRAs also influences ratings. Unlike these studies, I focus on the impact of borrower behavior, particularly their discretion over reported

[4] Moreover, in addition to accruals management, this study examines CFO management, particularly CFO management that does not change earnings, which neither Alissa et al. (2013) nor Caton et al. (2011) pay attention to and doesn't necessarily have the same consequences as accruals management. When compared to Alissa et al. (2013) in particular, this study has different implications. Alissa et al. (2013) imply that firms guide their ratings through earnings management to keep capital structure stable, because ratings are viewed as a comprehensive measure of capital structure in modeling expected ratings. In contrast, this study suggests that PPrating firms use their discretion over reported numbers, CFO and accruals, to achieve more favorable ratings due to the use of ratings in debt contracts. More important, my results still hold after controlling for the effect of credit-rating targeting.

numbers, on firm ratings. I find CFO management and accruals management contribute to a higher firm rating for PPrating firms.

Lastly, this study contributes to the research on CFO management. Despite the abundance of cash flow misreporting in practice, many prior studies (e.g., Dechow et al. 1998; Badertscher et al. 2012) take reported CFO as given; not surprisingly, there is little research on CFO management. One notable exception is Lee (2012) who finds that firms inflate reported CFO under various situations, for instance, when investors consider CFO more important. Different from this paper that focuses on firms' *ex ante* incentive in managing CFO, my study centers on *ex post* consequences of CFO management, which has received little attention in the literature. It suggests that CFO management is distortive in that it affects the expectations of an essential information intermediary CRAs and hence leads to inflated firm ratings for PPrating firms. This evidence cautions users of cash flow information against relying completely on the reported CFO in forming their expectations and researchers against using CFO as a benchmark to evaluate earnings quality. The evidence also confirms the necessity of the recent regulatory efforts in providing more guidance on the preparation of cash flow statements (Deloitte & Touche LLP 2017).

The rest of the paper is structured as follows. The next section discusses the related literature and develops testable hypotheses. The third section describes the sample involved, the construction of variables, and the empirical model. The fourth section reports the empirical results for the main analysis, the fifth section reports the results for additional analysis, and the sixth section concludes the paper.

RELATED LITERATURE AND HYPOTHESES DEVELOPMENT

Literature on Credit-Rating Management

A firm's credit rating speaks to its creditworthiness. Principally, it represents a rating agency's independent, forward-looking assessment of a firm's long-term credit risk (McDaniel 1997). However, these credit ratings have an expansive role: they serve informational, contracting, and signaling roles as well as a regulatory role. The ratings issued by CRAs reduce information asymmetry between companies and capital providers, help monitor debt contracts, signal firm quality, and facilitate regulatory compliance (e.g., Listokin and Taibleson 2010; Becker and Milbourn 2011; Kisgen 2006).

Without a rating, firms cannot tap debt markets, particularly public debt markets, because ratings reduce information asymmetry between lenders and borrowers. Moreover, a lower rating can impede a firm's ability to access debt markets at a lower interest cost, since lower ratings are viewed as an indicator of high default risk (Kisgen 2006). Ratings are also widely used by banks in debt covenants and performance pricing provisions. Besides affecting a firm's debt capacity, ratings also impact ownership structure, because investment regulations are tied to firm ratings. For instance, low ratings can deter ownership by banks and pension funds (Kisgen 2006). Ratings are also perceived as a measure of firm quality, so a decline in ratings can lead to "a loss of a contract, a required repurchase of bonds, or a loss of access to the commercial paper market" (Kisgen 2006, 1036). For example, when firms enter into long-term supply contracts that require specific ratings from their counterparty (Kisgen 2006), a rating decline can result in a loss of contracts.

Given the wide range of effects from firm ratings, managers pay significant attention to firm ratings and may even attempt to influence them. Prior studies show that managers adjust a range of real activities to influence firm ratings. Kisgen (2009) shows that managers adjust the capital structure, lowering their leverage following a rating downgrade. However, he finds no

change in a firm's leverage following a rating upgrade. Based on these findings, he conjectures that firms work to maintain a minimum target-level credit rating, so as to procure lower financing costs while avoiding the regulatory requirements and scrutiny associated with a low rating threshold.

Recent studies also provide evidence that managers massage accounting numbers to influence firm ratings. Caton et al. (2011) focus on accrual-based earnings management around secondary market debt issuances and find that accruals management surrounding seasoned bond offerings contributes to lower credit ratings. Alissa et al. (2013) examine the use of earnings management to target an expected rating. They find that firms use income-increasing (decreasing) earnings management to raise (lower) their ratings toward a target rating level when current ratings are below (above) the target levels.

Hypothesis Development

Despite the above evidence on credit-rating management, there is little research on rating management related to firm ratings' contracting role. A large percentage of private debt contracts include provisions tied to firm ratings, such as rating triggers and performance pricing (Kraft 2015). Rating-based performance pricing implies that the interest rate charged on a loan is based on the borrower's rating—when firm ratings improve, the loan's interest rate falls; when firm ratings decline, the interest rate rises. Asquith et al. (2005) find that interest rates increase by 13.8 basis points for each step in the pricing grid. Given that credit rating changes could be associated with large variations in interest rates for PPrating firms, CRAs cater to these firms due to their concern for the adverse consequences of the contractual use of ratings (Kraft 2015). The potential for large interest rate changes and significant debt cost savings associated with credit

rating movement also gives borrowers strong incentives to influence their firm ratings (Kraft 2015).

Managers of PPrating firms can influence firm ratings through their discretion over real corporate decisions or reported accounting numbers. Since rating agencies emphasize the importance of cash flow adequacy to credit rating decisions, I focus on managerial discretion over reported CFO. In its rating criteria, S&P states that "cash flow adequacy is typically the single most critical aspect of credit rating analysis" (S&P's 2008, 41). S&P's guide on the methodology for determining ratings states:

> Interest or principal payments cannot be serviced out of earnings, which is just an accounting concept; payment has to be made with cash. Although there is usually a strong relationship between cash flow and profitability, many transactions and accounting entries affect one and not the other. Analysis of cash flow patterns can reveal a level of debt-servicing capability that is either stronger or weaker than might be apparent from earnings. (S&P's 2008, 24)

Given the centrality of cash flow to credit assessment, PPrating firms could manage cash flow to maintain or improve their ratings. If CRAs fail to adjust managed CFO, CFO management will help PPrating firms receive more favorable ratings.

However, *ex ante* it is far from clear whether managers of PPrating firms successfully use cash flow management to maintain or improve current ratings. There are several reasons they may not be able to do so. First, cash flow management is costly because it consumes managers' time and diverts their efforts from improving firm value. Managing cash flow by altering real activities could also have severe, negative, long-term consequences. If cash flow management is detected, the firm could lose credibility among stakeholders, and rating agencies could downgrade their rating. Second, cash flow management is not always feasible because cash flow is not perceived as an estimate and outsiders can verify it without incurring significant costs. Third, rating agencies have considerable expertise and access to a variety of information,

including private information; thus they might adjust managed CFO in evaluating firm creditworthiness. Further, reputational concerns give CRAs strong incentives to correct for CFO management.

In summary, although managers of firms with rating-based performance pricing provisions may have the incentive to manage CFO to maintain or improve their firm ratings, it is unclear *ex ante* whether they do so due to the costs and constraints they face in managing CFO and the potential for rating agencies to detect CFO management. This leads to the following testable hypothesis (stated in the alternate form):

H1a: For firms with rating-based performance pricing provisions, CFO management is associated with more favorable firm credit ratings.

Managers of PPrating firms can also influence firm ratings using their discretion over accruals. Alissa et al. (2013) show that accrual-based earnings management helps firms with ratings below (above) the expected ratings move their ratings upward (downward) toward the expected ratings. Similarly, PPrating firms could manage accruals to achieve their desired ratings because inflated accruals increase reported earnings, which CRAs consider in their rating decisions. If CRAs do not fully adjust managed accruals, accruals management will contribute to more favorable ratings for PPrating firms.

However, PPrating firms may not succeed in using accruals management to obtain their preferred ratings. First, similar to CFO management, accruals management incurs costs by diverting managerial attention away from improving firm value. Second, PPrating firms do not necessarily have the accounting flexibility to manage accruals to a magnitude large enough to influence firm ratings. Third, given rating agencies' suspicion of the accruals component of earnings due to the aggressive accounting associated with accruals (Moody's 2006; S&P's 2008),

rating agencies may scrutinize accruals more than cash flow.[5] Caton et al. (2011) find that although issuers engage in accruals management surrounding seasoned bond offerings, accruals management contributes to lower ratings.

In summary, even though managers of firms with rating-based performance pricing provisions attempt to use accruals management to maintain or improve their firm ratings, it remains an empirical question whether they can do so, due to the costs and constraints involved in managing accruals and the potential for rating agencies to undo accruals management. This leads to the following testable hypothesis (stated in the alternate form):

H1b: For firms with rating-based performance pricing provisions, accruals management is associated with more favorable firm credit ratings.

SAMPLE AND RESEARCH DESIGN

Sample and Data

The initial sample consists of all firm-year observations contained in the merged Compustat annual industrial file, including full coverage and research files, from 1988 through 2011. My sample coverage begins in 1988 because it is the first year when firms reported CFO in their cash flow statements. I collect financial statement data and firm ratings (S&P long-term issuer ratings) from Compustat. I also obtain bank loan data from Dealscan, which reports whether loan contracts have performance pricing features and whether they are based on ratings or accounting metrics. Then I merge the Compustat and Dealscan datasets using the Dealscan-gvkey linking dataset from Chava and Roberts (2008), which is updated through August 2012.

[5] Moody's (2006, 6) notes the following: "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."

The merged dataset starts in 1994 because the Dealscan database includes comprehensive information about performance pricing beginning with 1994 (Asquith et al. 2005).

Next, I require each observation to satisfy four requirements. First, it must have positive values for total assets and stockholders' equity. Second, it must be incorporated in the U.S. Third, its stock price at the fiscal year end must be greater than $1 per share. Fourth, it must have the necessary information to compute the dependent and independent variables used in the empirical models. To reduce the effect of outliers on the regression estimates, I winsorize each continuous variable in the upper and lower one percent tail of its distribution. The final sample consists of 3,864 firm-year observations, representing 581 firms.

Research Design

Dependent Variable: Firm Credit Rating

I employ firm credit rating as the dependent variable. Specifically, I follow prior research and use a firm's long-term issuer credit rating as assigned by S&P (Ashbaugh, Collins, and LaFond 2006). I convert these ratings into numerical scores (*RATING*) following Becker and Milbourn (2011). The highest numerical rating of 28 is assigned to the AAA letter rating, and the lowest numerical rating of 1 is assigned to the D or SD letter rating.

Test Variable: CFO Management

I measure CFO management using performance-adjusted unexpected CFO, based on Dechow et al. (1998) and Lee (2012). The rationale behind this measure is that managers have some discretion over CFO and could deliberately manage CFO upward through real activities or accounting discretion. For example, managers can shift items among the statement of cash flow categories.[6] They can also increase reported CFO at fiscal year-end by delaying payments to

[6] Deloitte & Touche LLP (2017) state that the Financial Accounting Standards Board (FASB) has directed the Emerging Issues Task Force (EITF) to take into account nine cash flow classification issues.

suppliers and accelerating collections from customers. The performance adjustment is motivated by the concern that unexpected CFO could capture real firm performance.

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

$$CFO_t/TA_{t-1} = \lambda_0 + \lambda_1(1/TA_{t-1}) + \lambda_2(SALE_t/TA_{t-1}) + \lambda_3(\Delta SALE_t/TA_{t-1}) + \lambda_4(ROA_t) + \varepsilon \qquad (1)$$

I then use the parameter estimates from equation (1) to construct expected *CFO (ECFO)* and measure the unexpected CFO *(UCFO)* as deviations from the normal levels (i.e., the residual from the model). Higher values of *UCFO* indicate more *CFO* management.[7]

I choose the cross-sectional version of the Dechow et al. (1998) model over its time-series counterpart as used by Lee (2012) for many reasons.[8] First, the cross-sectional model generates a bigger sample. Second, the parameter estimates are more precise for the cross-sectional versions than for the time-series versions, since the number of observations per model is considerably higher for the cross-sectional model. The parameter estimates are also better specified for the cross-sectional versions than for the time-series versions, since the average standard errors of the coefficients are smaller and there are fewer outliers. Third, the time-series model is estimated over a lengthy period of up to ten years; thus, it is possible for the model to be misspecified because of non-stationarity. Fourth, time-series analysis over a long period could bias the sample toward mature, stable firms (Lee 2012). Lastly, the time-series model has lower statistical power due to overlapping estimation and treatment periods.

[7] I view this metric as a valid measure for CFO management for multiple reasons, although some prior research uses the non-performance-adjusted version as a measure for real earnings management. First, Lee (2012) conducted validity tests of a similar measure of CFO management, estimated using time-series data. Second, I run several tests to verify my metric estimated using cross-sectional data, *UCFO*, as a proxy for CFO management in the fourth section. Third, the influence of real activities management on unexpected CFO is unclear *a priori* since it affects unexpected CFO in different directions (Zang 2011). Consequently, more recent studies (e.g., Zang 2011) have started to move away from using unexpected CFO as a measure for real earnings management.

[8] When estimating unexpected accruals, prior studies choose the cross-sectional version of the Jones model over its time-series counterpart for similar reasons (Subramanyam 1996).

Test Variable: Accruals Management

Following the prior literature (see McNichols (2000) and Beneish (2001) for a review), I measure accruals management using performance-adjusted abnormal accruals estimated with the modified Jones (1991) model. Specifically, I estimate the following model using data for each industry-year with at least 10 observations:

$$TACC_t/TA_{t-1} = \beta_0 + \beta_1(1/TA_{t-1}) + \beta_2(\Delta Sales_t/TA_{t-1}) + \beta_3(PPE_t/TA_{t-1}) + \beta_4(ROA_t) + \varepsilon \quad (2)$$

Then I use the estimated coefficients and the following model to generate the performance-adjusted normal accruals (*EACC*) and abnormal accruals (*UACC*, the residual from the model):

$$TACC_t/TA_{t-1} = \beta_0 + \beta_1(1/TA_{t-1}) + \beta_2[(\Delta Sales_t - \Delta AR_t)/TA_{t-1}] + \beta_3(PPE_t/TA_{t-1}) + \beta_4(ROA_t) + \varepsilon \quad (3)$$

Control Variables

The control variables are drawn primarily from prior research on the determinants of corporate credit ratings (e.g., Horrigan 1966; Kaplan and Urwitz 1979; Boardman and McEnally 1981; Lamy and Thompson 1988; Ziebart and Reiter 1992; Ashbaugh et al. 2006). I control for leverage (*LEV*), interest coverage (*INT_COV*), and the existence of accounting losses (*LOSS*) because loss firms and firms with higher leverage and smaller interest coverage ratios face higher default risk. I also control for firm size (*SIZE)* because larger firms face lower risk. Because firms with more tangible assets tend to have high liquidation values and lower agency costs of debt (Harris and Raviv 1990; Williamson 1988), I control for tangibility of assets using *CAP_INTEN*. I also include *ECFO* (expected CFO) and *EACC* (expected accruals) to control for fundamental performance. Finally, I include loan size (*LOANSIZE)* and maturity

(*LOANMATURITY)* to control for the possibility that rating decisions are influenced by these loan features (Kraft 2015). Detailed variable definitions appear in the Appendix.

Empirical Models

I use the sample of firms with rating-based performance-priced loan contracts to estimate the following regression models to test hypotheses H1a and H1b:

$$RATING_{t+1} = \alpha_0 + \beta_1 UCFO_t + \beta_2 UACC_t + \sum_{q=3}^{m} \beta_q (q^{th} Control\ Variables_t) + \sum Industry + \sum Year + \varepsilon \quad (4)$$

Equation (4) is estimated using ordered logit regression. To alleviate concerns about the potential time-series and cross-sectional dependence in the data, I report Z-statistics using Huber-White standard errors corrected for firm clustering (Petersen 2009; Cameron, Gelbach, and Miller 2011). H1a (H1b) predicts a positive association between CFO (accruals) management and future ratings for PPrating firms. Hence I expect $\beta_1 > 0$ under H1a and $\beta_2 > 0$ under H1b.

MAIN ANALYSES – TESTS OF H1

Descriptive Statistics

Table 1 presents descriptive statistics for all variables used in the empirical model to test the hypotheses. Panel A presents the descriptive statistics for the whole rating-based performance pricing sample.[9] The mean and median values of *RATING* are 19.250 and 19.000, respectively, which are very similar to those reported in Becker and Milbourn (2011). The mean and median values of *UCFO* are close to zero, which is not surprising. Recall that *UCFO* is the residual from the cash flow expectation model. Similarly, the mean and median values of *UACC*

[9] About 71.7 percent of observations with private debt have performance pricing provisions, of which 56.4 percent have rating-based performance pricing features. The untabulated univariate tests indicate that firms with performance pricing provisions have higher leverage, smaller size, lower capital intensity, larger loans, and longer loan maturity; they are also more likely to experience losses than other firms without performance pricing provisions. However, their abnormal CFO and abnormal accruals are not significantly different from those of firms without performance pricing provisions.

are close to zero. The mean and median values of leverage are 0.297 and 0.289, respectively. The mean value of the natural log of total assets is $8.651 million, and the median value is $8.528 million.

Panel B presents the descriptive statistics for the two subsamples of the rating-based performance pricing sample with positive and negative *UCFO*. Although the subsample with positive *UCFO* has lower leverage, it is not composed of firms with systematically better performance than those in the negative *UCFO* subsample. For instance, the negative *UCFO* subsample has higher expected CFO/accruals than the positive *UCFO* subsample.

Empirical Results

Test of Hypotheses H1a* and *H1b

Table 2 reports the results of pooled cross-sectional ordered logit regressions using *RATING* as the dependent variable. In column (1), the coefficients on *UCFO* and *UACC* are both positive and significant, which is consistent with the view that for PPrating firms, both CFO management and accruals management contribute to more favorable future ratings. However, the estimated coefficients in column (1) could be unreliable due to the correlated omitted variable, the current year's rating. In other words, firms with good ratings in the current year may manage CFO/accruals to maintain their ratings and these firms could have a higher chance to receive more favorable ratings in the following year. In column (2), I rectify this by including the current year's rating as an additional control. The coefficients on *UCFO* and *UACC* are still both positive and significant, which is consistent with H1a and H1b.[10]

[10] A major concern about using unexpected CFO as a measure for CFO management is that it captures firm performance and reflects cash flow shocks not captured by the economic model. If real cash flow shocks arise from some industry- or year-specific factors, then my industry-year estimation of equation (1) should have lessened this concern. If real cash flow shocks are due to unexpected changes in sales activities, the control for sales and the corresponding changes in equation (1) should have mitigated this concern. However, if CRAs execute rigorous cash flow analysis, they should not respond to transitory cash flow shocks since firm ratings aim to reflect long-term

The coefficients on the control variables are generally consistent with prior research (Ashbaugh et al. 2006). In column (1), the coefficients on *LOSS* and *LEV* are negative and significant, suggesting that loss firms and firms with high leverage are less likely to have high ratings. The coefficients on *SIZE* and *CAPINT* are positive and significant, indicating that large firms and firms with high capital intensity are more likely to receive high ratings in the following year. The coefficient on *LOANSIZE* is negative and significant, suggesting that firms with large loans are less likely to have higher ratings. In column (2), the results on control variables are generally similar to those in column (1), except for a few variables. The coefficients of *LOSS*, *SIZE*, *CAP_INT*, and *LOANSIZE* become insignificant after I control for current ratings because current ratings may have captured the effect of these variables. In column (2), I also find that longer loan maturity and higher current ratings are associated with future ratings.

Moreover, the coefficients on *ECFO* and *EACC* are positive and highly significant in both columns, suggesting that the fundamental cash flow and accrual performance are positively associated with future ratings. The Wald tests show that the coefficient on *UCFO* is significantly lower than that on *ECFO* (p-value <0.001 in both columns), while the coefficient on *UACC* is significantly lower than that on *EACC* (p-value <0.001 in column (1), p-value =0.011 in column

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creditworthiness of bond issuers. Nonetheless, to further address the concern that my results are driven by real cash flow shocks, I conduct performance adjustment for the measure of CFO management using alternative performance metrics and alternative approaches. First, I re-estimate unexpected CFO and unexpected accruals using the following alternative performance metrics one at a time: income before extraordinary items divided by lagged total assets, operating income before depreciation divided by lagged total assets, and net income divided by lagged total assets. The untabulated results consistently show that irrespective of the performance metrics used in performance adjustment, CFO management and accruals management are positively associated with future ratings for PPrating firms. Similar to Lee (2012), I also adjust unexpected CFO and unexpected accruals in year t estimated directly using the Dechow et al. (1998) model and the modified Jones (1991) model, respectively, by the median (mean) of the firm's deviation from the industry over the last five years (i.e., year t-1 to t-5). The untabulated results are similar to those reported in Table 2. In addition, I follow Ashbaugh et al. (2006) to convert the letter ratings into seven numerical categories and then re-estimate equation (4). The untabulated results remain similar to those reported in Table 2. I also follow Kraft (2015) to use OLS regression to rerun the multivariate model in equation (4) and find that the results in Table 2 hold. I also re-test H1a and H1b using change analysis. The untabulated results show that the changes in both *UCFO* and *UACC* are significantly and positively related to future rating changes, providing additional support for H1a and H1b.

(2)). These results suggest that although rating agencies fail to adjust CFO/accruals management for PPrating firms fully, they are cautious about these managerial opportunistic behaviors.

Overall, the results in Table 2 indicate that PPrating firms tend to have better ratings in the future when they engage in more CFO (accruals) management. Moreover, these results hold after I control for expected CFO, expected accruals, current ratings, and other determinants of firm ratings documented in prior studies. In short, they provide support for H1a and H1b.

Robustness Checks and Results

Validity of unexpected cash flow from operations measure

The validity of my inferences depends on the validity of unexpected CFO as a measure for CFO management and the validity of unexpected accruals as a measure for accruals management. Unexpected accruals is relatively well accepted and widely used in the literature (Kothari, Leone, and Wasley 2005; Dechow, Ge, and Schrand 2010), so I do not execute additional tests to validate it as a proxy for accruals management. I do, however, conduct additional tests to validate unexpected CFO as a proxy for CFO management.[11]

Test of persistence of cash flows

The managed portion of CFO is likely to be more transitory than the unmanaged portion because the former is non-recurring. For example, Dynegy manages CFO upward by restructuring a complex transaction through a special purpose entity to masquerade a loan as operating cash flow, but this inflates the reported CFO in only one period. To examine whether the managed portion of CFO is less persistent for PPrating firms, I conduct two tests. One uses the sample of PPrating firms to evaluate whether unexpected CFO is less persistent than expected CFO. The other uses the full loan sample to examine whether unexpected CFO is less

[11] Lee (2012) has conducted several tests to validate a similar measure estimated using time-series data.

persistent for PPrating firms than for other firms with bank loans.[12] If unexpected CFO is less persistent, it provides support that unexpected CFO reflects CFO management because PPrating firms are more likely to manage CFO and managed CFO tends to be more transitory.

For the first test, I estimate the following model similar to that used in Lee (2012) and then compare the coefficients on *UCFO* and *ECFO*:

$$CFO_{t+1} = \beta_0 + \beta_1 ECFO_t + \beta_2 UCFO_t + \beta_3 ACC_t + \varepsilon_{t+1}$$

(5)

The model includes *ACC* because accruals have additional information beyond current cash flows in explaining future cash flows (Dechow et al. 1998). Panel A of Table 3 presents the results. Consistent with the conjecture that unexpected CFO is less persistent than expected CFO for PPrating firms, the coefficient on *UCFO* is smaller than that on *ECFO*.[13, 14]

For the second test, I use the full loan sample to estimate the following model similar to that used in Lee (2012):

$$\begin{aligned} CFO_{t+1} = {} & \beta_0 + \beta_1 UCFO_t + \beta_2 PPRATING_t + \beta_3 UCFO_t \times PPRATING_t \\ & + \beta_4 PPACCT_t + \beta_5 UCFO_t \times PPACCT_t + \beta_6 ECFO_t + \beta_7 ACC_t + \varepsilon_{t+1} \end{aligned}$$

(6)

The model includes *PPACCT* because accounting-based performance pricing provisions may incentivize firms to manage CFO. Panel B of Table 3 presents the results. Consistent with the

[12] The full loan sample includes PPrating firms and all other firms with loans except those that have both rating-based and accounting-based performance pricing provisions.

[13] Note that the coefficient on *ACC* is smaller than the coefficients on *UCFO* and *ECFO*, which suggests that accruals are less persistent than either unexpected CFO or expected CFO. This is because accruals can include arbitrary reserves, unusual levels of depreciation (or amortization), and different inventory valuation methods, which makes accruals less likely to recur in future periods (Sloan 1996).

[14] If the performance adjustment does not perfectly take out the component of CFO driven by firm performance, then *UCFO* could reflect extreme performance; under this situation, *UCFO* would be less persistent than *ECFO*. To address this concern, I exclude observations with extreme performance, i.e., those in the top (top and bottom) quintile (decile) of annual cumulative return (annual buy-hold abnormal return), and then redo the tests in Panel A of Table 3. I find similar results (untabulated for brevity).

conjecture that unexpected CFO is less persistent for PPrating firms than for other firms with bank loans, the coefficient on *UCFO×PPRATING* is negative and significant.

Test of validity of unexpected cash flow from operations using restatement sample

The validity of unexpected CFO as a proxy for CFO management depends on how well the modified Dechow et al. (1998) model identifies the expected CFO. To confirm the validity of my measure, I hand-collect data on CFO restatements due to a classification error in the cash flow statement. The purpose is to show that the CFO as predicted by the modified Dechow et al. (1998) model is on average an unbiased estimate of the restated CFO and that the predicted CFO is significantly different from the originally reported CFO.

To do so, I obtain a sample of CFO restatements following procedures similar to those used by Lee (2012). First, I identify restatements from 1999 through 2011 that were due to cash flow statement (SFAS No. 95) classification errors as documented in Audit Analytics. I then exclude cash flow restatements that are not related to CFO and cash flow restatements in which restated CFO is higher than the originally disclosed CFO. This generates a sample of firms with classification errors that overstated CFO. I then merge this restatement sample with my loan sample and obtain 84 firm-year observations.[15] Next, I test the difference between CFO estimated through the modified Dechow et al. (1998) model and the restated CFO. The difference, scaled by lagged total assets, is insignificant (0.005 with a p-value of 0.447 based on two-tailed tests), suggesting that the predicted CFO is an unbiased estimate of the actual CFO absent any classification error. I also test the difference between the predicted CFO and the originally reported CFO. The difference, scaled by lagged total assets, is -0.010 (p-value = 0.057

[15] In merging the restatement sample with my loan sample, I require the restatements to take place in the same year as the measurement of UCFO. If there are multiple restatements for a given firm-year, I keep the last restatement. The untabulated results are similar when I keep the first restatement.

based on two-tailed tests), indicating that the model is capable of identifying an overstatement of CFO.[16, 17]

CFO/Accruals management for firms with rating-based loan contracts

In the primary analyses, I assume that PPrating firms are more likely to manage CFO and accruals to achieve better ratings. To test whether this assumption holds empirically, I examine whether PPrating firms are more likely to undertake CFO/accruals management than firms with accounting-based performance pricing provisions. I follow Kraft (2015) to choose firms with accounting-based performance pricing as the benchmark group because these firms are more similar to PPrating firms than firms that have neither (Asquith et al. 2005).[18] Although firms with accounting-based performance pricing could also have the incentive to manage CFO/accruals, they should overall have a weaker incentive to do so since some of these firms use metrics that have nothing to do with CFO/accruals in performance pricing.

Following Lee (2012) and Roychowdhury (2006), I include *SIZE*, *MB*, *SUSPECT*, *EARN*, and *UACC* (*UCFO*) as control variables when predicting CFO management (accruals management). Panel A of Table 4 presents the results, which are consistent with the conjecture that PPrating firms are more likely to manage CFO and accruals.

Relation between CFO/accruals management and credit rating conditional on the presence of rating-based performance pricing provisions

[16] I do not exclude cash flow restatements accompanied by earnings restatements because some CFO management does influence earnings. As a sensitivity check, I remove cash flow restatements accompanied by earnings restatements and repeat the above tests. I similarly find that the expected CFO is not significantly different from the restated CFO, but it is significantly smaller than the originally reported CFO (untabulated for brevity).

[17] To further confirm the validity of *UCFO* as a measure of CFO management, I also test whether firms with high *UCFO* are more likely to have a CFO-decreasing restatement. When using the rating-based performance pricing sample, I find that only 0.15 percent of the firm-years in the low-*UCFO* group experience a CFO-decreasing restatement compared with 0.59 percent of the firm-years falling in the high-*UCFO* group; and this difference is statistically significant. When using the full loan sample, I find that 0.30 percent of the firm-years in the low-*UCFO* group experience a CFO-decreasing restatement compared with 0.78 percent of the firm-years falling in the high-*UCFO* group; and this difference is statistically significant.

[18] I exclude the small group of firms whose performance pricing is based on both accounting metrics and ratings.

An alternative explanation for my results is that banks monitor PPrating firms more closely than other firms, which could lead to abnormally higher CFO/accruals and better ratings. To address this concern, I follow Kraft (2015) to use firms with accounting-based performance pricing provisions as a control group to investigate whether unexpected CFO and accruals are more likely to be associated with better ratings for PPrating firms than for control firms.[19] Panel B of Table 4 reports the results, which are consistent with my prediction and provide further support that PPrating firms are more likely to achieve better ratings through CFO/accruals management.

ADDITIONAL ANALYSIS AND DISCUSSION

CFO Management That Does Not Change Earnings and Firm Credit Ratings

Thus far, when I analyze the effect of CFO management on future ratings, I have not distinguished between CFO management that changes earnings and CFO management that does not. For instance, if a firm manages CFO through a timing strategy, i.e., by delaying payments to suppliers and accelerating collections from customers, such CFO management does not change earnings (Lee 2012). Also, when firms use classification shifting to manage CFO, earnings do not change. To better understand the effect of CFO management that does not change earnings, I next examine the effect of CFO management through classification shifting and timing strategy on future ratings.

To examine the effect of CFO management through classification shifting, I further process the restatement sample discussed in the fourth section. I first exclude cash flow restatements accompanied by earnings restatements. Next, similar to Lee (2012), I match firms in the restatement sample with a control group based on industry and year because cash flow

[19] The selection of the control group is similar to that for the tests in Panel A of Table 4.

classifications for some transactions could be determined by industry norms. I then match the sample firms to the control firms with predicted creditworthiness between 90 and 110 percent of the sample's, since restatement firms could have systematically lower creditworthiness. To capture predicted creditworthiness, I use a procedure similar to that used by Demirtas and Cornaggia (2013).[20] After the matching process, I obtain a sample of 36 firm-year observations.

Using this matched sample, I conduct a univariate analysis. I find that restatement firms have higher ratings (mean=16.722) than non-restated firms (mean=14), and the difference is significant (two-sided p-value=0.001). However, I do not conduct multivariate analyses using this sample, since the sample is small and many assumptions underlying ordered logit regressions cannot be satisfied. If the matching is effective, the univariate analysis provides reasonable support that CFO management through classification shifting is positively associated with future ratings for PPrating firms.

To examine the effect of CFO management through timing strategy, I follow Lee (2012) to measure timing. I first estimate the change in cash conversion cycle from the fourth quarter in year t to the first quarter in year t+1 (*ΔCC*).[21] To adjust for seasonal variation in the cash conversion cycle, I then subtract the industry-year-quarter mean of *ΔCC* from the firm's *ΔCC*. To compare the effect of CFO management through timing strategy with that of other types of CFO management and separately identify the effect of each, I next convert the adjusted change in cash conversion cycle and unexpected CFO into annual decile ranks (*CC1RANK* and *UCFORANK*).

[20] I first estimate the credit rating model without including CFO and accruals but after including other explanatory variables in column (1) of Table 2. I then use the estimated coefficients to predict ratings for each firm-year. Kisgen (2006) and Asquith et al. (2005) use similar procedures to predict ratings, though their models are slightly different.

[21] Managers can reduce days in inventory by not buying additional inventory, which can decrease cost of goods sold and increase earnings. To address this issue, I construct an alternative measure of change in cash conversion cycle by excluding days in inventory. The untabulated results yield inferences similar to those reported in the paper.

Column (1) of Panel A of Table 5 presents the results for alternative specifications of equation (4) after I replace *UCFO* and *UACC* with *UCFORANK* and *UACCRANK* and add *CC1RANK*. The sum of the coefficient on *UCFORANK* and that on *CC1RANK* is positive and highly significant, indicating that CFO management through timing strategy is positively associated with future ratings.[22] As a sensitivity check, I adjust the firm's *ΔCC* by the industry-year-quarter median of *ΔCC* and redo the analysis in column (1). Column (2) presents similar results. Overall, these results show that for PPrating firms, CFO management through timing strategy is positively associated with future firm ratings.

In summary, the above analyses show that whether or not CFO management eventually changes earnings, it contributes to more favorable future ratings for PPrating firms.

Managerial Discretion over Expenses and Production and Firm Credit Ratings

The literature classifies earnings management into accrual earnings management and real activities earnings management (e.g., Roychowdhury 2006; Zang 2011). The most common types of real activities earnings management prior studies have examined are a reduction in discretionary expenses and overproduction. Meanwhile, researchers have viewed earnings as having two components: accruals and CFO. Naturally, earnings can be managed through accruals or cash flow components. Since the reduction in discretionary expenses corresponds to higher contemporaneous CFO (Roychowdhury 2006), I, like Lee (2012), consider this as one mechanism for CFO management.[23] Since overproduction creates an excess inventory

[22] I interpret the coefficients similarly to Jung, Soderstrom, and Yang (2013). *UCFORANK* captures overall CFO management, while *CC1RANK* captures a type of CFO management. Thus, when both *UCFORANK* and *CC1RANK* are included in the model, the coefficient on *CC1RANK* indicates the relation between CFO management through timing strategy and future ratings that is incremental to the relation between other types of CFO management and future ratings. Thus, the sum of the coefficient on *UCFORANK* and that on *CC1RANK* indicates the relation between CFO management through timing strategy and future ratings.

[23] Alissa et al. (2013, 135) also state that "Our third metric for real activities management, abnormal discretionary expenses, captures managers' attempts to reduce discretionary expenditures, such as research and development,

(Roychowdhury 2006), I consider it as one mechanism for accruals management.[24] Next, I examine the effect of these two mechanisms on future ratings beyond the effect of other mechanisms of CFO management and accruals management.

To capture managerial discretion over expenses and production, I construct abnormal discretionary expenses and abnormal production cost. Then I multiply the abnormal discretionary expenses by negative one (*UDISEXP*) so that higher values imply more CFO management. Similarly, I measure the abnormal production costs (*UPROD*) as deviations from the normal production costs estimated from the modified Roychowdhury (2006) model. Detailed variable definitions appear in the Appendix.

Panel B of Table 5 presents the results of including these two variables in equation (4). The sum of the coefficient on *UCFO* and that on *UDISEXP* is positive and significant, suggesting that for PPrating firms, CFO management through managerial discretion over expenses increases future ratings.[25] The sum of the coefficient on *UACC* and that on *UPROD* is positive and significant, indicating that for PPrating firms, accruals management through overproduction contributes to better ratings. In addition, the coefficient on *UCFO* and that on *UACC* are both significantly positive, suggesting that for PPrating firms, CFO management other than a reduction in discretionary expenses and accruals management other than overproduction lead to more favorable ratings.

Cross-sectional Analysis Conditional on Benefit of Inflating Firm Credit Ratings

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selling, general, and administrative expenses, and advertising expenses, in order to increase the cash flow component of earnings."

[24] Meanwhile, overproduction could lead to lower CFO for given sales levels (Roychowdhury 2006) because overproduction firms incur production and holding costs that are not recovered in the same period through sales. But I do not consider overproduction as a mechanism for CFO management since the change in CFO is a side effect of overproduction, not the major consequence or intent of overproduction.

[25] I interpret the coefficients similarly to Jung et al. (2013).

The positive relation between CFO/accruals management and firm ratings is built on the argument that CRAs do not fully adjust these managerial opportunistic behaviors for PPrating firms. But given that CRAs react less to the managed CFO/accruals components than to the unmanaged CFO/accruals components, they are to some extent cautious about CFO/accruals management. To corroborate this argument, I conduct cross-sectional analyses to examine how the relation between CFO/accruals management and ratings varies with the benefit of inflating ratings. When a larger benefit is associated with inflated ratings, PPrating firms have stronger incentives to inflate ratings using CFO/accruals management. But CRAs could well understand such incentives and the amplified information risk, given their knowledge about the contractual use of ratings (Moody's 2001; S&P's 2008). As a result, they are likely to become more cautious and impose more scrutiny (S&P's 2008).[26] Thus, I expect that the relation between CFO/accruals management and firm ratings for PPrating firms becomes less pronounced when the benefit of inflating firm ratings is larger.

To test this cross-sectional prediction, I capture the benefit of inflating ratings using three measures defined based on rating-based performance pricing grids. The first measure (*BENEFIT1*) is the maximum value of the difference between the highest rating-based performance pricing grid and the current rating for all loan facilities within a firm-year. The second measure (*BENEFIT2*) is the weighted average of the difference between the highest rating-based performance pricing grid and the current rating for all loan facilities within a firm-year, where the weight is the loan amount. The third measure (*BENEFIT3*) is the difference between the maximum value of the rating-based performance pricing grid for all loan facilities within a firm-year and the current rating. The rationale for these measures is that when firm

[26] Rating agencies state in their rating criteria that "To the extent we believe information risk exists, it can influence our decisions to maintain a rating, assign a rating in the first place, or the level of the rating assigned" (S&P's 2008, 40).

ratings move towards the highest rating-based performance pricing grid, the interest rate charged on a loan decreases, which leads to debt cost savings. In defining *BENEFIT2*, I use loan amount as the weight because larger loan amount corresponds to higher debt costs for a given interest rate; hence, when firm ratings improve, it implies higher debt cost savings for loan facilities with the larger loan amount.

I then re-estimate equation (4) after including these alternative measures, one at a time, and their interactions with CFO management and accruals management, respectively. Table 6 presents the results. Regardless of the partitioning variables, the coefficients on *UCFO* × *BENEFIT* and *UACC* × *BENEFIT* are both negative and significant. These results suggest that when a larger benefit is associated with inflated ratings for PPrating firms, rating agencies impose more scrutiny over CFO/accruals management, which leads to a less pronounced relation between CFO/accruals management and firm ratings.

Do My Results Simply Reflect More Favorable Ratings for Better-performing Firms?

An alternative explanation is that the results simply reflect more favorable ratings for better-performing firms. I address this concern in multiple ways. First, I conduct performance adjustment using several performance metrics and different approaches when I construct measures for CFO/accruals management. Second, throughout the paper I control for accounting losses as well as expected CFO and accruals, which capture fundamental performance. Third, I use change analysis to re-examine the impact of CFO/accruals management. Since fundamental performance is relatively stable, the change analysis can mitigate the concern that my results are driven by firm performance. Fourth, the corroborating results from the cross-sectional tests also mitigate this concern. For an omitted variable like performance to explain why the relation between CFO/accruals management and ratings becomes less pronounced when a larger benefit

is related to inflated ratings, it has to influence both CFO/accruals management and ratings to a lesser extent.

To further rule out the alternative explanation related to firm performance, I conduct an additional test. I partition the sample of PPrating firms based on the median of firm profitability into two subgroups: high and low profitability. Then I run equation (4) within the two partitions to examine the relation between CFO/accruals management and ratings separately for the two subsamples.[27] The partition serves as a natural matching mechanism and ensures that firms with similar profitability are compared. The untabulated results show that whether using the subsample with high or low profitability, I consistently find that CFO management and accruals management are positively associated with future ratings for PPrating firms. These results further mitigate the concern that my results are driven by firm performance.

Addressing the Confounding Effect of Credit-Rating Targeting

Alissa et al. (2013) document that firms with ratings below (above) the expected ratings can achieve upgrades (downgrades) through income-increasing (decreasing) earnings management activities, to move back toward their expected ratings. I do not expect that PPrating firms have strong incentives to move ratings upward and downward to hit a target rating predicted by a leverage-targeting model, because these firms always have the incentive to move ratings upward to the highest performance pricing grids due to the significant debt cost savings. Nevertheless, I use two approaches to address the confounding effect of rating targeting. The first puts the tests for H1a and H1b in the empirical framework of targeting an expected rating. I do so by including all the additional variables included in the expected rating model of Alissa et

[27] Kraft (2015) uses a similar approach to address an alternative explanation in her paper.

al. (2013).[28] The second approach includes the rating targeting variable, *DIFF*, and its interaction with CFO/accruals management, as in Alissa et al. (2013). The untabulated results indicate that the tenor of the results reported earlier still holds.[29]

CONCLUSIONS

This study examines whether firms with rating-based performance-priced loan contracts manage CFO and accruals to influence their firm ratings. Rating-based contracts link interest payments to changes in firm ratings and hence provide borrowers with incentives to influence firm ratings through their discretion over reported numbers. However, it is an empirical question whether borrowers with rating-based performance-priced contracts use CFO/accruals management to achieve the desired ratings. First, CFO management and accruals management incur costs and face constraints; hence, managers may choose not to engage in CFO/accruals management that is significant enough to influence ratings. Second, CRAs may undo managed CFO and accruals in assessing a firm's credit profile. Therefore, I explore the impact of CFO/accruals management on ratings for PPrating firms empirically.

Using a sample of U.S. firms with rating-based performance pricing provisions, I document the following results. I find a positive association between CFO management and future firm ratings. I also find a positive association between accruals management and future ratings. These results on CFO/accruals management are robust to a battery of sensitivity analyses. In addition, I find that the association between CFO/accruals management and firm ratings is muted when a larger benefit is associated with inflated ratings. Overall, my results suggest that

[28] Kisgen (2006) adopts a similar approach to test whether their results persist within previous empirical tests of the pecking order and tradeoff capital structure theories.
[29] Since Alissa et al. (2013) focus on rating changes, I also use the above two approaches in a change model. I find similar results (untabulated for brevity).

financial statement manipulation helps firms with rating-based loan contracts to achieve better ratings, but this manipulation proves less effective when there is more monitoring by CRAs.

The validity of the inferences so far is conditional on the validity of unexpected CFO as a measure of CFO management and unexpected accruals as a measure of accruals management. I run multiple tests to validate unexpected CFO as a measure of CFO management and perform various analyses to mitigate the concern that my results reflect firm performance, rather than managerial opportunism. Nevertheless, I acknowledge that I cannot completely rule out the possibility that unexpected CFO and unexpected accruals have measurement issues and my results could partially reflect firm performance.

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APPENDIX

Variable Definitions

Dependent variables

RATING is assigned numeric rating score following Becker and Milbourn (2011).

Test variables

UCFO is the difference between actual CFO and the performance-adjusted expected (fitted) CFO, where the performance-adjusted expected CFO (*ECFO*) is estimated by running the modified Dechow et al. (1998) model cross-sectionally for industry-years with at least 10 observations:

$$CFO_t/TA_{t-1} = \lambda_0 + \lambda_1(1/TA_{t-1}) + \lambda_2(SALE_t/TA_{t-1}) + \lambda_3(\Delta SALE_t/TA_{t-1}) + \lambda_4(ROA_t) + \varepsilon$$

where *CFO* is the operating cash flow for the period t, *TA* is the total assets for the period t-1, *SALE* is the sales during period t, Δ*SALE* is the change in sales during period t, and *ROA* is the return over assets (operating income after depreciation divided by lagged total assets) during period t.

UACC is the difference between actual accruals and the performance-adjusted (fitted) normal accruals based on the modified Jones (1991) model. Similar to Dechow, Sloan, and Sweeney (1996), I first estimate the following model cross-sectionally for industry-years with at least 10 observations:

$$TACC_t/TA_{t-1} = \beta_0 + \beta_1(1/TA_{t-1}) + \beta_2(\Delta Sales_t/TA_{t-1}) + \beta_3(PPE_t/TA_{t-1}) + \beta_4(ROA_t) + \varepsilon$$

where *TACC* is total accruals for the period t, *TA* is the total assets for the period t-1, *ΔSALES* is change in sales for the period t, *PPE* is gross property and equipment for period t, and *ROA* is the return over assets (operating income after depreciation divided by lagged total assets) during period t. Then I use the estimated coefficients and the following model to generate the performance-adjusted normal and abnormal accruals:

$$TACC_t/TA_{t-1} = \beta_0 + \beta_1(1/TA_{t-1}) + \beta_2[(\Delta Sales_t - \Delta AR_t)/TA_{t-1}] + \beta_3(PPE_t/TA_{t-1}) + \beta_4(ROA_t) + \varepsilon$$

where Δ*AR* is the change in accounts receivable.

Control variables

ECFO is performance-adjusted expected CFO estimated by running the modified Dechow et al. (1998) model cross-sectionally for industry-years with at least 10 observations.

EACC is performance-adjusted expected accrual estimated by running the modified Jones (1991) model cross-sectionally for industry-years with at least 10 observations.

LEV is total debt (Compustat #9 plus Compustat #34) divided by total assets.

LOSS is one if the net income before extraordinary items is negative in the current and prior fiscal year, zero otherwise.

INT_COV is operating income before depreciation (Compustat #13) divided by interest expense, and then divided by 10^{10}.

SIZE is the natural log of total assets.

CAP_INTEN is gross PPE divided by total assets.

LOANSIZE is the natural log of the amount of loan.

LOANMATURITY is the natural log of the maturity of loan.

Other variables

ACC is the total accruals, measured as income before extraordinary items less cash flows from operations, scaled by lagged total assets.

PPRATING is one if, at fiscal year end, the borrower has at least one active loan facility outstanding that contains a rating-based performance pricing feature, and zero otherwise.

PPACCT is one if, at fiscal year end, the borrower has at least one active loan facility outstanding that contains an accounting metrics-based performance pricing feature, and zero otherwise.

MB is the ratio of a firm's market value of assets to total assets, where the market value of assets is total assets minus book equity plus market equity.

SUSPECT is an indicator variable that equals 1 if net income scaled by total assets is greater than or equal to zero but less than 0.005, and 0 otherwise.

EARN is income before extraordinary item divided by total assets.

UCFORANK is the yearly decile rank of *UCFO*.

UACCRANK is the yearly decile rank of *UACC*.

CC1RANK is the yearly decile rank of the adjusted *CC1*, where the adjusted *CC1* is the difference between the change of cash conversion cycle and its industry-year-quarter average. The change of cash conversion cycle is the change of cash conversion cycle from the fourth quarter in year t to the first quarter in year t+1, where the cash conversion cycle is defined as the days in accounts receivables plus days in inventory minus days in accounts payable.

CC2RANK is the yearly decile rank of the adjusted *CC2*, where the adjusted *CC2* is the difference between the change of cash conversion cycle and its industry-year-quarter median. The change of cash conversion cycle is the change of cash conversion cycle from the fourth quarter in year t to the first quarter in year t+1, where the cash conversion cycle is defined as the days in accounts receivables plus days in inventory minus days in accounts payable.

UDISEXP is negative one times performance-adjusted abnormal discretionary expenses estimated from the modified Roychowdhury (2006) model. Specifically, I run the following regression for all firms in the same industry (two-digit SIC) each year:

$$DISEXP_t / TA_{t-1} = \alpha_0 + \alpha_1 (1/TA_{t-1}) + \beta_1 (S_{t-1}/TA_{t-1}) + \beta_2 ROA_t + \varepsilon_t$$

where *DISEXP* is discretionary expense calculated as the sum of (a) advertising expenses, (b) R&D expenses, and (c) selling, general, and administrative expenses; *S* is sales; *TA* is total assets; *ROA* is operating income after depreciation divided by lagged total assets.

The abnormal discretionary expenses are computed as the difference between the actual values and the normal levels predicted from the above equation.

UPROD is the performance-adjusted abnormal production costs estimated from the modified Roychowdhury (2006) model. Specifically, I run the following regression for all firms in the same industry (two-digit SIC) each year:

$$PROD_t / TA_{t-1} = \alpha_0 + \alpha_1(1/TA_{t-1}) + \beta_1(S_t / TA_{t-1}) + \beta_2(\Delta S_t / TA_{t-1}) + \beta_3(\Delta S_{t-1} / TA_{t-1}) + \beta_4 ROA_t + \varepsilon_t$$

where *PROD* is defined as the sum of cost of goods sold and change in inventory during the period; *S* is sales; ΔS is change in sales; *TA* is total assets; *ROA* is operating income after depreciation divided by lagged total assets. The abnormal production costs are computed as the difference between the actual values and the normal levels predicted from the above equation.

BENEFIT1 is the maximum value of the difference between the highest rating-based performance pricing grid and the current rating for all loan facilities within a firm year. Specifically, I first convert the performance pricing rid, rating_min from Dealscan, into numerical values in the same way as I convert firm ratings from Compustat. Since each performance pricing provision has multiple values in grid, I take the maximum value of the numerical rating_min for each rating-based performance pricing provision of each loan, and then have the current rating to be subtracted from it. Next, I take the maximum value of this difference within a firm year.

BENEFIT2 is the weighted average of the difference between the highest rating-based performance pricing grid and the current rating for all loan facilities within a firm year, where the weight is the loan facility amount. Specifically, I first convert the performance pricing rid, rating_min from Dealscan, into numerical values in the same way as I convert firm ratings from Compustat. Since each performance pricing provision has multiple values in grid, I take the maximum value of the numerical rating_min for each rating-based performance pricing provision of each loan, and then have the current rating to be subtracted from it. Next, I use the loan amount as the weight to calculate the weighted average of this difference within a firm year.

BENEFIT3 is the difference between the maximum value of the rating-based performance pricing grid for all loan facilities within a firm year and the current rating. Specifically, I first convert the performance pricing rid, rating_min from Dealscan, into numerical values in the same way as I convert firm ratings from Compustat. Then I take the maximum value of the numerical rating_min within a firm year, and have the current rating to be subtracted from it.

DIFF is the difference between the actual ratings and the expected ratings estimated following Alissa et al. (2013).

TABLE 1

Descriptive Statistics

This table presents descriptive statistics for firm credit ratings, CFO management, accruals management, and control variables. The sample period is from 1994-2011. All variables are defined in Appendix.

Panel A: descriptive statistics for the whole rating-based performance pricing sample

	N	Mean	Std	25%	Median	75%
$RATING_{t+1}$	3864	19.250	2.598	18.000	19.000	21.000
$UCFO_t$	3864	0.000	0.038	-0.021	0.000	0.021
$UACC_t$	3864	0.002	0.043	-0.019	0.003	0.025
$ECFO_t$	3864	0.108	0.055	0.073	0.100	0.137
$EACC_t$	3864	-0.058	0.039	-0.073	-0.052	-0.037
LEV_t	3864	0.297	0.134	0.198	0.289	0.382
$LOSS_t$	3864	0.044	0.206	0.000	0.000	0.000
INT_COV_t	3864	0.001	0.002	0.000	0.001	0.001
$SIZE_t$	3864	8.651	1.118	7.834	8.528	9.411
CAP_INT_t	3864	0.646	0.381	0.335	0.602	0.923
$LOANSIZE_t$	3864	20.991	1.105	20.212	20.986	21.764
$LOANMATURITY_t$	3864	4.031	0.393	3.871	4.094	4.170

Panel B: descriptive statistics for the two rating-based performance pricing subsamples

	$UCFO_t<0$	$UCFO_t>0$		
	Mean	Mean	Difference	P-value
$RATING_{t+1}$	19.167	19.337	-0.170	0.042
$UCFO_t$	-0.028	0.028	-0.057	0.000
$UACC_t$	0.021	-0.018	0.039	0.000
$ECFO_t$	0.112	0.104	0.008	0.000
$EACC_t$	-0.054	-0.061	0.007	0.000
LEV_t	0.304	0.290	0.014	0.001
$LOSS_t$	0.046	0.042	0.004	0.519
INT_COV_t	0.001	0.001	0.000	0.002
$SIZE_t$	8.682	8.619	0.062	0.083
CAP_INT_t	0.577	0.717	-0.140	0.000
$LOANSIZE_t$	21.043	20.938	0.105	0.003
$LOANMATURITY_t$	4.022	4.039	-0.017	0.182

TABLE 2

CFO Management, Accruals Management, and Firm Credit Ratings

This table presents ordered logit regressions to test H1a (H1b), the relation between CFO (accruals) management and firm credit ratings for firms with rating-based performance pricing provisions. The sample period is from 1994 through 2011. All variables are defined in Appendix. 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.

	Pred. Sign	$RATING_{t+1}$	
		(1)	(2)
$UCFO_t$	**+**	**12.572*****	**5.746*****
		(6.58)	**(4.14)**
$UACC_t$	**+**	**10.825*****	**4.667*****
		(7.67)	**(4.08)**
$ECFO_t$	+	20.076***	9.960***
		(11.89)	(10.98)
$EACC_t$	+	16.614***	7.842***
		(9.95)	(5.95)
LEV_t	-	-3.037***	-0.775**
		(-5.09)	(-2.35)
$LOSS_t$	-	-1.667***	0.009
		(-6.82)	(0.04)
INT_COV_t	+	47.315	-7.603
		(0.89)	(-0.34)
$SIZE_t$	+	1.019***	0.08
		(10.42)	(1.50)
CAP_INT_t	+	0.542**	-0.025
		(2.31)	(-0.19)
$LOANSIZE_t$	?	-0.512***	-0.004
		(-5.85)	(-0.09)
$LOANMATURITY_t$	?	-0.287	0.171**
		(-1.51)	(2.11)
$RATING_t$	+		2.937***
			(29.01)
N		3864	3864
Pseudo R^2		0.145	0.573

TABLE 3

Persistence of Unexpected CFO vs. Expected CFO

This table presents the results of regressing future CFO on the expected and unexpected components of current CFO. Panel A uses the rating-based performance pricing sample, while Panel B uses the full loan sample. The sample period is from 1994 to 2011. All variables are defined in Appendix. Standard errors for the coefficient estimates are heteroskedasticity-robust and clustered by firm. Industry and year fixed effects are included in the regression. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Significance levels are based on two-tailed tests.

Panel A: use the rating-based performance pricing sample

	Coefficient	T-statistics
UCFO	0.572***	13.75
ECFO	0.769***	32.52
ACC	0.178***	6.6
Constant	0.060***	7.93
ECFO≠UCFO	**P-value<0.001**	
N	3690	
Adj. R^2	0.472	

Panel B: use the full loan sample

	Coefficient	T-statistics
UCFO	0.618***	14.56
PPRATING	-0.002	-1.19
UCFO × PPRATING	**-0.101****	**-1.99**
PPACCT	-0.006***	-3.01
UCFO × PPACCT	-0.058	-1.15
ECFO	0.700***	45.43
ACC	0.119***	7.88
Constant	0.070***	13.78
N	9415	
Adj. R^2	0.445	

TABLE 4

Robustness Checks

This table presents the regression results of robustness checks for H1a and H1b. Panel A tests whether PPrating firms are more likely to manage CFO/accruals, while Panel B tests whether the relation between CFO/accruals management and ratings is more pronounced for PPrating firms. The sample period is from 1994-2011. All variables are defined in Appendix. 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: CFO/accruals management for firms with rating-based loan contracts

	Dependent variable	
	$UCFO_t$	$UACC_t$
	(1)	(2)
PPRATING$_t$	**0.005*****	**0.003****
	(2.89)	**(2.02)**
$SIZE_t$	-0.001**	-0.001
	(-2.23)	(-1.15)
MB_t	-0.007***	-0.015***
	(-6.20)	(-12.79)
$SUSPECT_t$	-0.001	0
	(-0.40)	(0.04)
$EARN_t$	0.190***	0.311***
	(14.02)	(19.53)
$UACC_t$	-0.615***	
	(-45.71)	
$UCFO_t$		-0.737***
		(-46.46)
Constant	0.004	0.003
	(0.52)	(0.43)
N	6167	6167
Adj. R^2	0.458	0.527

Panel B: the relation between CFO/accruals management and credit rating conditional on the presence of rating-based performance pricing provisions

	$RATING_{t+1}$
$UCFO_t$	7.986***
	(4.94)
$PPRATING_t$	1.850***
	(8.89)
$UCFO_t \times PPRATING_t$	**7.699*** **
	(3.04)
$UACC_t$	2.779**
	(2.15)
$UACC_t \times PPRATING_t$	**11.005*** **
	(5.71)
Controls	YES
N	6167
Pseudo R^2	0.238

TABLE 5

Specific Types of CFO/Accruals Management and Firm Credit Ratings

This table presents the regression results of the effect of specific types of CFO/accruals management on firm credit ratings. Panel A focuses on CFO management through timing strategy, while Panel B focuses on CFO (accruals) management through managerial discretion over expenses (production). The sample period is from 1994-2011. All variables are defined in Appendix. 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: CFO management through timing strategy and firm credit ratings

	Dependent variable: $RATING_{t+1}$	
	$CCRANK_t$ =	
	$CC1RANK_t$	$CC2RANK_t$
	(1)	(2)
$UCFORANK_t$	0.081***	0.081***
	(4.68)	(4.71)
$UACCRANK_t$	0.071***	0.072***
	(4.32)	(4.44)
$CCRANK_t$	-0.002	-0.027**
	(-0.14)	(-2.04)
Controls	YES	YES
$UCFORANK_t$ + $CCRANK_t$	**P-value<0.001**	**P-value=0.013**
N	3603	3603
Pseudo R^2	0.58	0.581

Panel B: Managerial discretion over expenses and production and firm credit ratings

	$RATING_{t+1}$
	(2)
$UCFO_t$	5.991***
	(3.79)
$UACC_t$	4.467***
	(3.46)
$UDISEXP_t$	0.947**
	(2.10)
$UPROD_t$	-0.932*
	(-1.73)
Controls	YES
$UCFO_t$ + $UDISEXP_t$	**P-value<0.001**
$UACC_t$ + $UPROD_t$	**P-value=0.014**
N	3061
Pseudo R^2	0.587

TABLE 6

Cross-sectional Tests Conditional on Benefit of Inflating Firm Ratings

This table presents the regression results on the effect of CFO/accruals management on firm credit ratings conditional on the benefit of inflating firm ratings. The sample period is from 1994-2011. All variables are defined in Appendix. 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: $RATING_{t+1}$		
		$BENEFIT_t =$	
	$BENEFIT1_t$	$BENEFIT2_t$	$BENEFIT3_t$
	(1)	(2)	(3)
$BENEFIT_t$	-0.023	-0.033	-0.023
	(-0.90)	(-1.24)	(-0.90)
$UCFO_t$	9.176***	9.295***	9.176***
	(4.38)	(4.51)	(4.38)
$UCFO_t \times BENEFIT_t$	**-1.703****	**-1.895****	**-1.703****
	(-2.26)	**(-2.49)**	**(-2.26)**
$UACC_t$	7.289***	7.957***	7.289***
	(4.11)	(4.56)	(4.11)
$UACC_t \times BENEFIT_t$	**-1.283***	**-1.730****	**-1.283***
	(-1.83)	**(-2.37)**	**(-1.83)**
Controls	YES	YES	YES
N	3863	3860	3863
Pseudo R^2	0.573	0.573	0.573