

CREDIT RISK AND OFF-BALANCE-SHEET CONTRACTUAL OBLIGATIONS:  
DISCLOSURES UNDER RULE FR-67

by

SHA ZHAO

A dissertation submitted to the Graduate Faculty in Business in partial fulfillment of the requirements for the degree of Doctor of Philosophy, The City University of New York

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ALOKE GHOSH

\_\_\_\_\_  
Date

\_\_\_\_\_  
Chair of Examining Committee

JOSEPH WEINTROP

\_\_\_\_\_  
Date

\_\_\_\_\_  
Executive Officer

MASAKO N. DARROUGH

SONALI HAZARIKA

RONG HUANG

CHRISTINA MASHRUWALA

Supervisory Committee

THE CITY UNIVERSITY OF NEW YORK

## ABSTRACT

### CREDIT RISK AND OFF-BALANCE-SHEET CONTRACTUAL OBLIGATIONS: DISCLOSURES UNDER RULE FR-67

by

Sha Zhao

Adviser: Professor Alope Ghosh

To increase transparency in financial reporting and to promote a better understanding of companies' off-balance sheet obligations, the Securities and Exchange Commission issued Final Rule No. 67 (FR-67) to mandate a tabular disclosure of all known on- and off-balance sheet contractual obligations in a single location within the Management's Discussion and Analysis (MD&A) from 2003. Using a sample of S&P 1500 companies, I examine whether the disclosures under Rule FR-67 influence the assessment of credit risk by credit rating agencies, public bond holders, and private loan lenders. I find that all four credit risk measures (i.e., credit ratings, negative credit watch, bond spreads, and the number of covenants in private loan contracts) significantly increase with off-balance sheet obligations when the firms report the tabular disclosures of contractual obligations for the first time. My results also suggest that the three major debt-market participants view purchase obligations at least as relevant as operating leases and other types of off-balance sheet obligations in explaining firms' credit risk. This evidence should be of interest to regulators, investors, and creditors in addressing the present debate about to what extent off-balance sheet items should be recognized on the balance sheet.

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## 1. INTRODUCTION

In January 2003, the Securities and Exchange Commission (SEC) mandated via Final Rule No. 67 (FR-67) a tabular disclosure of “all known contractual obligations,” including both on- and off-balance sheet obligations, in a single location within the Management’s Discussion and Analysis (MD&A) section of the registrant’s annual reports.<sup>1</sup> The compliance date for the rule is a firm’s first fiscal year ending on or after December 15, 2003. Prior to Rule FR-67, information about the SEC registrants’ off-balance sheet obligations might or might not be disclosed. Even if it is disclosed, it is usually dispersed throughout the firms’ financial reports inconsistently across firms.

The tabular disclosure of contractual obligations under Rule FR-67 affect financial reporting in two ways: (1) all material contractual obligations are placed in a table in one location of the MD&A section, which are easier to read, especially off-balance sheet obligations, and (2) some contractual obligations, e.g., purchase obligations, which were not required to be disclosed before are now disclosed under Rule FR-67. From the time when the rule was first proposed in 2002 (SEC 2002), a vast controversy about its impacts has been echoed in the comment letters to the SEC. Supporters believe that placing all material contractual obligations in a table in one location improves the transparency of off-balance sheet arrangements (e.g., Cangialosi 2002). Opponents argue that the disclosure does not improve transparency because the information was previously disclosed or because off-balance sheet obligations are not accurately estimable due to large uncertainty in future cash flows (e.g., Echols 2002).

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<sup>1</sup> Final Rule: *Disclosure in Management's Discussion and Analysis about Off-Balance Sheet Arrangements and Aggregate Contractual Obligations*, Release Nos. 33-8182; 34-47264; FR-67 (January 27, 2003), is available at <http://www.sec.gov/rules/final/33-8182.htm>.

Prior research has presented alternative hypotheses on the usefulness of disclosed financial information. The *efficient market hypothesis* posits that once an item has been included in the financial reports, the location and presentation format of the item would not convey new information (Schipper 2007). In contrast, the *incomplete revelation hypothesis* (Grossman and Stiglitz 1980, Bloomfield 2002) predicts an undervaluation of disclosed information because users may lack the ability, knowledge, or willingness to process certain information thoroughly (e.g., Davis-Friday et al. 2004, Schipper 2007). Therefore, the effect of the disclosure of off-balance sheet obligations under Rule FR-67 on a firm's information transparency is ambiguous.

Because an important motivation for using off-balance sheet obligations is to reduce the recognized on-balance sheet leverage, one would expect that a more complete and transparent disclosures of off-balance sheet obligations in a tabular format will help investors better assess the credit risk of firms. In this paper, I focus on the assessment of off-balance sheet obligations by three major debt-market participants, credit-rating agencies, public bond holders, and private loan lenders. It is unclear, *ex ante*, whether rating agencies take off-balance sheet obligations into account when assessing credit risk. On the one hand, rating agencies claim that they make analytical adjustments to reflect issues regarding cash flow adequacy and liquidity, including the off-balance sheet stratagems (e.g., Standard and Poor's 2008). On the other hand, they are often accused of having been less than thorough in reviewing companies' public filings and having incentives to maintain ratings at a particular level (e.g., SEC 2003, Barth et al. 2012). Therefore, whether and how rating agencies evaluate off-balance sheet obligations disclosed in the tabular format becomes an empirical question.

In contrast with credit rating agencies, debt holders do not have incentives to distort the assessment of risk (Barth et al., 2012). If debt holders interpret off-balance-sheet obligations as

liabilities, these obligations should add to the risk associated with on-balance sheet liabilities. If so, debt holders would demand a higher yield and/or impose more stringent covenants in debt contracting to protect themselves against the potential risk of claim dilution from off-balance sheet obligations. For example, off-balance sheet items are frequently included in the measurement rules specified for private debt covenants. In general, loan agreements contain definitions of liabilities more encompassing than U.S. GAAP (Leftwich 1983, Ramsay and Sidhu 1998).<sup>2</sup>

This paper examines whether and how the off-balance sheet obligations contained in tabular disclosure format under Rule FR-67 influence the debt market's assessment of credit risk. Despite the far reaching consequences of Rule FR-67, little research has systematically examined this rule. A few studies examine market evaluation of off-balance sheet financing (e.g., Shevlin 1991, Ely 1995, Lim et al. 2003, Jin et al. 2006, Niu and Richardson 2006, Barth et al. 2012), but they only focus on a particular off-balance sheet item (e.g., R&D limited partnership, operating leases, pension plans, and asset securitizations). In contrast, this study analyzes different types of off-balance sheet obligations disclosed under the Rule and their relative importance in explaining the assessment of firms' credit risk.

Following earlier studies that use hand-collected data (e.g., Chen et al. 2008, Kohlbeck and Mayhew 2010, Conyon et al. 2011), I start with S&P 1500 companies. I limit the sample to S&P 1500 because: (1) the tabular disclosures of contractual obligations are not machine-readable and hand collecting the data from Form 10-Ks is time consuming; (2) S&P 1500

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<sup>2</sup> For example, in the loan agreements, contingencies are defined to include, "obligations under any contract for the purchase of materials, supplies, other property or services..." and "obligations...substantially equivalent to a guarantee" (Leftwich 1983). Appendix A provides an example of credit agreement with restrictive covenants including off-balance sheet items.

companies are selected from large, medium, and small firms, which represent an economically significant portion of all publicly traded firms.

I examine the influence of off-balance sheet obligations on four distinct measures of credit risk following firms' first tabular disclosures. The first measure is Moody's bond rating. Specifically, I use the initial ratings for new bonds and the one-year-ahead ratings for existing bonds. The results in this study show that Moody's bond ratings for newly issued as well as existing bonds are both significantly positively related to off-balance sheet obligations after controlling for firm and bond characteristics.<sup>3</sup>

Next, I use the likelihood of negative credit watch as the second measure of credit risk. Credit ratings can be sticky and remain stable over a credit cycle (Crouhy et al. 2001). Rating agencies can issue credit watches to indicate a direction of potential rating changes. Therefore, a negative credit watch predicts a potential rating downgrade. I find that the likelihood of a negative credit watch in one year after the firm's adoption of Rule FR-67 increases with the magnitude of off-balance sheet obligations, suggesting that rating agencies adjust their assessment of credit risk, following firms' disclosures under Rule FR-67.

The third measure of credit risk is bond-yield spreads. Specifically, I examine the effect of off-balance sheet obligations on the bond spreads for newly issued and existing public bonds by regressing the bond-yield spreads on on-balance-sheet leverage and the present value of future payments for off-balance-sheet obligations, controlling for firm and bond characteristics. Consistent with the credit rating results, the bond spread results show that firms with more off-balance sheet obligations are subjected to higher effective interest costs for issuing new bonds and higher transaction costs for existing bonds.

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<sup>3</sup> Moody's bond rating ranges from 1 to 21 corresponding to "Aaa" through "C."

The fourth measure of credit risk is the number of restrictive covenants in private loan contracts. Private debt holders are likely to monitor borrowers through covenant restrictions. The results show that the number of covenants in private loan contracts is significantly positively associated with off-balance sheet obligations, controlling for firm and loan characteristics. These findings are consistent with my expectation that private debt lenders perceive a potential threat of claim dilution from off-balance sheet obligations, and thus impose more debt covenants on borrowers.

Rule FR-67 in particular requires the tabular disclosure of two types of off-balance sheet obligations (i.e., purchase obligations and operating leases) and allows firms to provide additional information. Therefore, I further decompose the aggregated off-balance-sheet obligations into three components, purchase obligations, operating leases, and other off-balance-sheet obligations to examine how each component affects the assessment of credit risk by credit-rating agencies and debt holders. Purchase obligations represent a firm's commitment to purchase goods and services that are enforceable and legally binding in the future. The information on purchase obligations was not systematically disclosed before Rule FR-67, thereby can impose strongest effect on firms' credit risk. However, Andrade et al. (2011) find that purchase obligations have less impact on credit risk (i.e., credit-default-swap spreads) than operating leases. In contrast, I find that purchase obligations are at least as relevant as operating leases and other off-balance sheet obligations in explaining firms' credit risk.

In addition, I collect off-balance sheet obligations from previous annual footnote disclosures for a pilot sample. Using firms with non-zero purchase obligations, I compare the effect of off-balance-sheet obligations on bond-yield spreads in one year before and after the first tabular disclosures. I find that purchase obligations and other off-balance sheet obligations have

stronger effect on credit risk in the post-tabular disclosure period than in the pre-tabular disclosure period, suggesting that tabular disclosures of these obligations provide information in addition to textual footnote disclosures. However, disclosures of operating leases under Rule FR-67 provide little incremental information because operating leases were largely disclosed in a tabular format in previous annual footnotes.

This study makes four contributions to the literature. First, I highlight the importance of disclosures in the debt market's assessment of credit risk associated with off-balance sheet obligations. In contrast to prior studies, which estimate the impact of footnote disclosures of a particular off-balance sheet obligation on equity and/or credit risk, I use all the material off-balance sheet obligations for a large sample of firms and analyze the relative importance of different obligations. Decomposing off-balance sheet obligations into purchase obligations, operating leases, and other off-balance sheet obligations, I find that purchase obligations, required to be disclosed for the first time, are at least equivalent to the other obligations in explaining firms' credit risk. Second, in contrast to the allegations that credit rating agencies are not diligent in assessing credit risk associated with off-balance sheet obligations (e.g., Barth et al. 2012), I find that they do utilize the information about off-balance sheet obligations. Third, to the best of my knowledge, this paper is the first to document whether public- and private-debt lenders have the same assessment of credit risk associated with firms' off-balance sheet obligations. Bond-yield spreads reflect public information about credit risk, while private loan contracts reflect lenders' risk assessment through private communications with borrowers. Therefore, using both bond spreads and loan contracts allow me to provide evidence on whether off-balance sheet obligations have different influence on public- and private-debt lenders'



assessments of credit risk. Fourth, my study suggests that the tabular disclosure under Rule FR-67 is more effective and efficient in conveying information than textual footnote disclosure.

Taken together, my findings provide evidence that disclosures of off-balance-sheet contractual obligations under Rule FR-67 do convey information to the debt market in addition to previous footnote disclosures. This evidence should be of interest to regulators, investors, and creditors in addressing the present debate about to what extent off-balance sheet items should be recognized on the balance sheet.

The remainder of the paper proceeds as follows. Section 2 provides the background information for off-balance-sheet obligations and reporting requirements under Rule FR-67. Section 3 discusses prior research and develops testable hypotheses. Empirical models and variable definition are presented in section 4. Section 5 describes sample and data collection procedure, section 6 presents the results, and section 7 provides additional analyses and robustness tests. Finally, section 8 concludes.

## 2. BACKGROUND

### 2.1. Disclosure requirements under Rule FR-67

Since the major accounting scandals in the early 2000s, stemming from the usage of complex structures such as special purpose entities, firms' off-balance-sheet financial activities have been in the spotlight. Investors, auditors, analysts, and regulators have demanded more information on registrants' off-balance-sheet activities because companies might use off-balance-sheet accounts to hide losses and debt (e.g., Chang 2002). Recognizing the need for more information on off-balance-sheet arrangements, the SEC recommended that registrants disclose all material contractual obligations and commercial commitments in a single location within the MD&A section under Commission Statement FR-61 (SEC 2002);<sup>4</sup> yet FR-61 did not make this new disclosure mandatory.

In January 2003, tabular disclosure of contractual obligations was made mandatory under Rule FR-67 for annual reports with fiscal-year ending on or after December 15, 2003. Under Rule FR-67, contractual obligations are grouped into five major categories: (1) long-term debt, (2) capital lease obligations, (3) operating leases, (4) purchase obligations, and (5) other long-term liabilities.<sup>5</sup> The Rule allows a registrant to further disaggregate any of the above categories to provide additional information.<sup>6</sup> Tabular forms are accompanied with footnotes necessary to

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<sup>4</sup> Commission Statement FR-61 provides a tabular disclosure example of five major contractual obligations (i.e., long-term debt, capital leases, operating leases, unconditional purchase obligations, and other long-term obligations) and five commercial commitments (i.e., lines of credit, standby letters of credit, guarantees, standby repurchase obligations, and other commercial commitments).

<sup>5</sup> Quarterly or interim reports are not required to include this disclosure, but the reporting company needs to discuss material changes to the information previously disclosed in its annual reports.

<sup>6</sup> Rule FR-67 does not provide a detailed classification of all possible off-balance sheet obligations, but in the section about disclosures of off-balance sheet arrangements, it also requires companies to disclose contractual arrangements under which they have: guarantees, retained or contingent interests, derivative instruments, and variable interests. "Guarantees" relate to any obligation under certain guarantee contracts covered by the scope of FASB Interpretation No. 45 (FASB 2002). "Retained or contingent interest" is an

describe in detail material contractual provisions or other material information to indicate the timing and amount of the payments under each contractual obligation.

## 2.2. Classification of off-balance-sheet obligations

Accountants traditionally recognize liabilities as “probable future sacrifices of economic benefits arising from *present* obligations of a particular entity to transfer assets or provide services to other entities in the future as a result of *past* transactions or events” (FASB 1985, para. 35; FASB 2008, para. 35). Therefore, whether a contractual obligation should be recognized as a liability on balance sheet depends on whether the *present* obligation exists on the balance sheet date. Because the classification of off-balance sheet obligations is firm specific, I identify as many as 240 off-balance-sheet items from a comprehensive dataset of S&P 1500 companies. To compare the relative importance of different types of off-balance sheet obligations, I further classify these obligations into major categories:

- (1) operating leases,
- (2) purchase obligations,
- (3) interest obligations,
- (4) variable interest entities,
- (5) asset securitizations,
- (6) letters of credit,
- (7) lines of credit,
- (8) guarantees,
- (9) acquisition commitments,
- (10) credit facilities,
- (11) derivative commitments,
- (12) contingent liabilities, and

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alternative to guarantee contracts, which is interest in assets transferred to an unconsolidated entity or similar arrangement that serves as credit, liquidity or market risk support to such entity for such assets (Item 303 (a)(4)(ii)(B) of Regulation S-K). “Derivative interests” are any obligations under certain derivative interests under the scope of SFAS No. 133 (FASB 1998). “Variable interests” are any obligations held by an variable interest entity (VIE) providing financing, liquidity, market risk or credit risk support, or engaging in leasing, hedging or research and development services to the registrant (FASB Interpretation No. 46).

(13) other contractual agreements and commitments.<sup>7</sup>

U.S. GAAP already requires companies to disclose all of the specified off-balance-sheet obligation categories, except for purchase obligations (SEC 2003).<sup>8</sup> Purchase obligation is “an agreement to purchase goods or services that is enforceable and legally binding on the company that specifies all significant terms, including: fixed or minimum quantities to be purchased; fixed, minimum or variable price provisions; and the approximate timing of the transaction” (SEC 2003). Accordingly, a purchase obligation is an executory contract involving “a promise for a promise” (Ketz 2003) and a *future* obligation for a particular entity. Therefore, purchase obligations are not recognized as liabilities on the balance sheet. Rule FR-67 requires the tabular disclosure of purchase obligations because they could significantly affect firms’ liquidity (SEC 2003).

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<sup>7</sup> Panel A of Appendix B provides an example of tabular disclosures of contractual obligations. Appendix C provides the firm-specific off-balance-sheet obligation items identified from my sample.

<sup>8</sup> Purchase commitments associated with project financing arrangements (e.g., take-or-pay commitments), however are required to be disclosed under SFAS 47 (FASB 1981). The majority of long-term purchase obligations are not likely to be associated with financing arrangements (Forsyth et al. 2005), thus they were not required to be disclosed before Rule FR-67 (see Lee 2010 and Moon 2011).

### 3. RELATED LITERATURE AND HYPOTHESIS DEVELOPMENT

#### 3.1. Related literature

Prior literature has documented mixed evidence on the informativeness of disclosures in 10-K filings. The *efficient market hypothesis* states that market prices fully reflect all publicly available information (Fama 1970). If all financial report users are rational, knowledgeable, and not constrained by cognitive limitations, once an item has been included in the financial reports, the location and presentation of the item should not make any difference in how the information impacts the market (Schipper 2007). Alternatively, the *incomplete revelation hypothesis* asserts that information that is more costly to extract from public disclosures is less completely reflected in market prices (Grossman and Stiglitz 1980, Bloomfield 2002). For example, You and Zhang (2009) use word counts as a proxy for the information complexity and find that stock price is more likely to underreact for firms with more complex 10-K filings. In particular, researchers find that tabular presentations describing fair value and contract terms of derivatives and underlying nonderivative items are associated with stock market-based measures of commodity price risk exposure (Rajgopal 1999, Rajgopal and Venkatachalam 1998). Chambers et al. (2007) find that other comprehensive income (OCI) is priced when investors become more familiar with the predominant reporting location.

Therefore, I hypothesize that tabular disclosures of off-balance-sheet contractual obligations can provide additional information about firm risk. There are at least two reasons. First, off-balance-sheet information provided in a single location in the MD&A section is easier to read and more informative than when it is disclosed in disparate locations. Although various accounting standards require disclosures of obligations for future payments under contracts (e.g.,

debt, lease agreements, and take-or-pay commitments)<sup>9</sup> and under contingent commitments (e.g., guarantees, lines of credit, and letters of credit), such disclosures are usually dispersed throughout a registrant's filing and may not be presented in a consistent manner across registrants. Second, purchase obligations (related to ordinary courses of business) were not previously required, but are now required to be disclosed under Rule FR-67.

The bulk of prior literature focuses on the effect of off-balance-sheet financing on the market's assessment of equity risk. These studies find that off-balance sheet financing, such as operating leases (e.g., Lasman and Weil 1978, Imhoff et al. 1991, Imhoff et al. 1993, Ely 1995, Lim et al. 2003), pension plans (e.g., Dhaliwal 1986, Jin et al. 2006), asset securitizations (e.g., Niu and Richardson 2006, Chen et al. 2008, Landsman et al. 2008, Dechow and Shakespeare 2009), derivatives (e.g., Breuer 2000), and off-balance-sheet variable interest entities (e.g., Shevlin 1991, Zhang 2008) all affect the firm's future liquidity and capital resources. In addition, Cheng et al. (2011) find that banks that securitize financial assets face greater information uncertainty than non-securitizing banks.

In contrast, this study focuses on the effect of off-balance sheet obligations on the assessment of credit risk. The effect of off-balance sheet obligations on credit risk can differ from that on equity risk because being affected by risk differently, debt holders and equity holders are likely to perceive risk differently. In particular, under the option-pricing perspective, debt holders have limited downside risk and limited upside potential, while equity holders have limited downside risk and unlimited upside potential (e.g., Black and Scholes 1973, Merton 1973, Easton et al. 2009, Elliott et al. 2010).

This study is closely related to Andrade et al. (2011), which find that credit-default-swap spreads increase with unconditional purchase obligations and operating leases. My study differs

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<sup>9</sup> See, e.g., SFAS No. 129 (FASB 1997), SFAS No. 13 (FASB 1976), and SFAS No. 47 (FASB 1981).

from Andrade et al. (2011) in four aspects. First, I analyze the relative importance of purchase obligations compared with operating leases and all other types of off-balance sheet obligations, while Andrade et al. (2011) focus primarily on operating leases and purchase obligations. Second, I examine the incremental effect of off-balance sheet obligations disclosed under Rule FR-67 compared with those disclosed in previous annual footnotes, while Andrade et al. (2011) focus solely on obligations disclosed after the mandatory compliance date of Rule FR-67. Third, rather than studying the derivative-market's perception of credit risk, this paper contributes to the literature by examining whether different debt-market participants (i.e., credit rating agencies, public bond holders and private loan lenders) have the same assessment of credit risk associated with the tabular disclosures of off-balance-sheet contractual obligations. Fourth, unlike Andrade et al. (2011), I find that purchase obligations are at least as relevant as operating leases and other types of off-balance sheet obligations in explaining credit risk.

### *3.2. Hypotheses*

#### *3.2.1. Off-balance sheet obligations and credit ratings*

A credit rating consists of a letter rating and commentary if applicable (Frost 2007).<sup>10</sup> Prior literature reveals a vast controversy over the efficiency and timeliness of credit ratings in reflecting credit risk. On the one hand, credit analysts analyze the liquidity position of a firm and estimate the borrower's condition at the worst point in the credit cycle (e.g., Crouhy et al. 2001). Rating agencies state that they adjust total debt for various off-balance sheet liabilities, including operating leases, debt of joint ventures and unconsolidated subsidiaries, take-or-pay contracts, forward purchase or sale commitments, securitizations, letters of credit, guarantees, and other contingent liabilities (e.g., Moody's 2004, Standard and Poor's 2006, Standard and Poor's 2008).

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<sup>10</sup> The commentary can include a "rating outlook" or "rating review." A rating review (i.e., ratings on "Watchlist" or "On Watch") may end with a rating upgraded, downgrade, or no change to the rating in the near term (Moody's 2012).

Kraft (2011) finds that Moody's makes "hard" (quantitative) adjustments to reported financial statements for operating leases and securitizations.

On the other hand, credit rating agencies are accused of having been less than thorough in reviewing companies' public filings and failing to probe opaque disclosures (SEC 2003).<sup>11</sup> For example, Barth et al. (2012) find that the securitizing firm's credit ratings decrease with a firm's retained interest in the securitized assets but are unrelated to the portion of the securitized assets not retained by the firm. They conclude that credit ratings are not efficient enough in assessing the effect of off-balance sheet activities on credit risk. Therefore, I develop the first hypothesis in null form:

***Hypothesis 1a: Credit ratings are not associated with the magnitude of off-balance sheet obligations.***

Credit ratings can be sticky and tend to remain stable over a credit cycle (Crouhy et al. 2001). However, to indicate a direction of potential rating changes, rating agencies issue credit watches.<sup>12</sup> Moody's (1998) states that credit watches are important signals of changes in credit quality. Chung et al. (2012) find that credit watch actions are more frequently prompted by publicly known events than are rating actions. They also analyze press announcements of Moody's credit watch actions and find that 17.5% of the confirmed down watches in their sample are triggered by financial distress. Therefore, credit rating agencies might issue a

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<sup>11</sup> For example, in the aftermath of the Enron scandal, the SEC questioned whether the credit rating agencies conducted sufficiently thorough analyses of the issuers and fulfilled their important role in the marketplace (SEC 2003). In particular, the credit rating agencies' monitoring and review of Enron's finances fell "far below" the expected careful efforts (Report of the Staff to the Senate Committee on Governmental Affairs 2002).

<sup>12</sup> For example, Moody's has been publishing a "Watchlist" of ratings since 1985, which became formal rating actions in 1991. A rating is put on watch if: (1) the issuer has announced plans which would materially affect credit quality; (2) trends in the issuer's operations or financial strength may affect the issuer's willingness and ability to pay debts; or (3) an event occurs that changes the issuer's operating environment (Moody's 1998).



negative credit watch if they reassess credit risk following a firm's tabular disclosure of off-balance sheet obligations. Hence, I hypothesize the following (in alternative form):

***Hypothesis 1b:*** *The likelihood of a negative credit watch increases with the magnitude of off-balance sheet obligations.*

### 3.2.2. Off-balance-sheet obligations and bond-yield spreads

Built on the original insights of Black and Scholes (1973) and further introduced by Merton (1974), the structural models on corporate-bond pricing assume that default is triggered when the firm value falls below a threshold determined by the amount of debt outstanding.<sup>13</sup> Bond yield is thus expected to be an increasing function of business risk and leverage (e.g., Merton 1974, Leland 1994, Yu 2005, Chen et al. 2007). If the market is efficient, bond price should reflect leverage regardless of whether the debt is recognized on the face of balance sheet. Therefore, if bond holders perceive the risk of claim dilution from off-balance sheet obligations, they would demand a higher yield.

Kraft (2011) finds that bond-yield spreads increase with the rating agency's estimates of off-balance sheet debt (operating leases and securitizations). Barth et al. (2012) find that the securitizing firms' bond-yield spreads is positively related to both the firms' retained interest in the securitized assets and the portion of the securitized assets not retained by the firm. Therefore, I develop the second hypothesis as follows (in alternative form).

***Hypothesis 2:*** *Bond-yield spreads increase with the magnitude of off-balance sheet obligations.*

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<sup>13</sup> The threshold may not be stationary. Firms can adjust the leverage ratio in responses to changes in firm value. For example, Collin-Dufresne and Goldstein (2001) develop a structural model in which a firm has an option to issue new debt, thereby increasing the default risk and lowering the recovery rate in the event of default.

### 3.2.3. *Off-balance-sheet obligations and private loan covenants*

A fundamental role of balance sheet information is to facilitate loan decisions and monitor debt covenants (e.g., Watts 1974, Barth et al. 1998). Although private lending dominates the U.S. corporate debt market (Dichev and Skinner 2002), little research has studied the effect of the borrowers' off-balance sheet obligations on the design of private debt contracts.<sup>14</sup> Private market lenders' assessment of a borrower's credit risk may be affected by off-balance sheet obligations disclosed in the tabular disclosures for at least three reasons. First, unlike diffused groups of public bond holders, private market lenders have stronger incentives or greater capability to monitor borrowers through debt contracting (e.g., Diamond 1984, Diamond 1991, and Fama 1985). Second, private loan agreements contain definitions of liabilities more encompassing than U.S. GAAP, especially with respect to contingencies arising from guarantees and off-balance-sheet financing (Leftwich 1983, Ramsay and Sidhu 1998). Third, although private lenders could have greater access to a potential borrower's risk information through private communications, detailed and clear public disclosures reduce a lender's information-gathering costs to determine the default risk of a loan (Mazumar and Sengupta 2005).

Prior research argues that private debt contracts are more restrictive than public contracts (e.g., Ramsay and Sidhu 1998, Anantharaman et al. 2010). In addition, off-balance sheet numbers are frequently included in the measurement rules specified for private debt covenants. Therefore, I focus on the effect of off-balance sheet obligations on the usage of debt covenants. If private loan lenders perceive a potential threat of claim dilution from off-balance sheet

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<sup>14</sup> Prior research on private debt market and off-balance sheet financing focuses on the effect of private debt contracts on the usage of off-balance sheet financing, but not the opposite. For example, Mills and Newberry (2005) find that credit-constrained firms are more likely to use off-balance sheet financing to access lower-cost financing sources or avoid covenant violations.

obligations, they would impose more restrictive covenants. Therefore, I develop the third hypothesis as follows (in alternative form).

***Hypothesis 3: The number of private loan covenants increases with the magnitude of off-balance sheet obligations.***

#### *3.2.4. Credit risk and disclosure on purchase obligations*

Rule FR-67 imposes new disclosure requirements of disclosures on purchase obligations, which were not required to be disclosed either in financial statements or in footnotes under U.S. GAAP. The efficient market hypothesis implies that financial report users incorporate all relevant information, thus the tabular disclosure of off-balance sheet obligations under Rule FR-67 would add little when the information has already been disclosed in other formats. In contrast, purchase obligations that were not previously disclosed, thereby can bring new information about firms' credit risk to the debt market.

However, the impact of purchase obligations on credit risk can be less than that of other off-balance sheet obligations because debt values are affected by the seniority of claims held by other contractors. For example, Andrade et al. (2011) find that purchase obligations are less “economically binding” than operating leases. Therefore, I develop the fourth hypothesis in null form:

***Hypothesis 4: Purchase obligation is as relevant as operating lease and other types of off-balance sheet obligations in explaining credit risk.***

## 4. RESEARCH DESIGN

### 4.1. Measuring off-balance sheet obligations

Merton (1974) defines the risk premium on debt as an increasing function of the debt-to-firm value ratio ( $d$ ) measured as the present value of the promised payment to the current value of the firm.

$$R(\tau) - r_f = \frac{-1}{\tau} \log[P(d, \sigma^2 \tau)] \quad (1)$$

where  $R(\tau) - r_f$  is the risk premium on the risky debt;  $P$  is the current price of the risky payment promised at time  $\tau$  in the future;  $\sigma^2 \tau$  is the volatility of the firm's value over the life of the bond. Therefore, contractual obligations including both on- and off-balance sheet items should follow the wealth allocation mechanism of total firm value among equity holders, debt holders and other contractors who are entitled to *fixed* contractual cash payments. One dollar of off-balance sheet obligations would be expected to reduce a firm's equity value by one dollar if the market interprets these obligations as liabilities (e.g., Landsman 1986, Barth 1991, Espahbodi et al. 1991, Wahlen 1994, Barth and McNichols 1994, Liu et al. 1997, Cohen et al. 2011). In addition, credit agencies state in their corporate ratings criteria that the main ratio they use for leverage analysis is total debt to the sum of total debt and equity, where total debt includes various off-balance sheet liabilities and analytical adjustments (e.g., Standard and Poor's 2008).

Therefore, I adjust the debt-to-firm value ratio by including both on- ( $D_{BS}$ ) and off-balance sheet liabilities ( $OBSO$ ) in total debt ( $D$ ). Following Graham et al. (1998) and Pittman and Fortin (2004), the adjusted debt-to-firm value ratio is:

$$\frac{D}{D + E} = \frac{D_{BS} + OBSO}{D_{BS} + OBSO + E} \quad (2)$$

where *OBSO* is measured as the present value of total off-balance-sheet contractual obligations and commercial commitments, and *E* is the fiscal-year-end market value of equity.<sup>15</sup> Therefore, the firm value includes the effect of off-balance sheet obligations, while the total fixed claims are defined as the book value of on-balance sheet liabilities plus the present value of all off-balance sheet obligations.

#### 4.2. Off-balance sheet obligations and credit ratings

I begin the analysis by examining the relation between credit ratings and off-balance sheet obligations. Specifically, I examine credit rating agencies' assessment of credit risk through: (1) Moody's bond-level ratings, and (2) the likelihood of a "negative credit watch."

To examine the effect of off-balance sheet obligations on credit ratings for newly issued bonds, I estimate a bond-level regression as follows.

$$\begin{aligned}
 \text{Rating} = & \beta_0 + \beta_1 \text{OBSO} + \beta_2 \text{Leverage} + \beta_3 \text{Size} + \beta_4 \text{ROA} + \beta_5 \text{MB} + \beta_6 \text{CUMRET} + \beta_7 \text{Beta} \\
 & + \beta_8 \text{Earnings Volatility} + \beta_9 \text{Capital Intensity} + \beta_{10} \text{Cash Flow} + \beta_{11} \text{Negative Equity} \\
 & + \beta_{12} \text{Firm Age} + \beta_{13} \text{Big4} + \beta_{14} \Delta \text{Firm size} + \beta_{15} \Delta \text{Leverage} + \beta_{16} \text{Maturity} \\
 & + \beta_{17} \text{Subordinate} + \beta_{18} \text{Put} + \beta_{19} \text{Call} + \beta_{20} \text{Offer Size} + \sum \text{Industry} + \varepsilon,
 \end{aligned} \tag{3}$$

where *Rating* is Moody's initial rating assigned within one month after a bond's offering date, which range from 1 to 21 for Aaa through C rated bonds. Therefore, higher numeric values of *Rating* indicate greater credit risk.

*Firm characteristics: Leverage* equals total on-balance-sheet liabilities divided by the fiscal-year end firm value. Firm value is measured as the market value of common equity plus the book value of total on-balance sheet liabilities and the present value of total off-balance sheet obligations. *Size* is the natural logarithm of fiscal year-end total assets. *ROA* equals earnings

<sup>15</sup> I also partition off-balance-sheet obligations (*OBSO*) into purchase obligations (*Purchase Obligation*), operating leases (*Operating Lease*), and all other types of off-balance-sheet obligations (*Other OBSO*) to examine how each component affects credit risk. See Panel B of Appendix B for the method of calculating the present value of off-balance sheet obligations.

before extraordinary items and discontinued operations, deflated by the fiscal year-end total assets. *MB* is the market-to-book ratio, measured as the market value of common equity divided by the book value of common equity. *CUMRET* is the cumulative daily stock returns over the fiscal year in which a firm provides the first tabular disclosure of contractual obligations. *Beta* is the systematic risk estimated from the market model using monthly stock returns in the five years up to the first year of the firm's tabular disclosure. *Earnings Volatility* is the standard deviation of quarterly income before extraordinary items divided by total assets for the past five years up to the first year of the firm's tabular disclosure. *Capital Intensity* is total property, plant, and equipment divided by total assets. *Cash Flow* is cash flows from operations deflated by total assets. *Negative Equity* is an indicator variable equal to one for firms with negative book value of equity. *Firm Age* is the number of years for which total assets is reported in Compustat since 1970; *Big 4* is an indicator variable equal to one if the firm is audited by a Big 4 auditor.  $\Delta Firmsize$  is the average change of total assets over the past five years;  $\Delta Leverage$  is the average change of leverage over the past five years. I also include the industry indicator variables (Fama and French 1997).

Off-balance sheet obligations and firm characteristics are measured at the end of the fiscal year (Year 0) in which the firm made the first tabular disclosure to ensure that information relating to these variables is available to credit rating agencies. I include *Size* because creditors perceive larger firms as less risky (Blackwell et al. 1998, Pittman and Fortin 2004, Elliott et al. 2010). *ROA* and *Cash Flow* are included because profitability is expected to be negatively related to default risk (Shi 2003, Barth et al. 2012), while firms that can generate more cash internally can better service their debts (Pittman and Fortin 2004). *MB* represents growth that can be positively associated with risk, while *CUMRET* represents stock price performance (Bhojraj

and Sengupta 2003).<sup>16</sup> Cost of debt increases with the fraction of total assets in property, plant and equity (*Capital Intensity*) because riskier borrowers must provide security for their loans (Pittman and Fortin 2004). Firms with negative book value of common equity (*Negative Equity*), high systematic risk (*Beta*) and operating risk (*Earnings Volatility*) are more likely to experience financial distress and thus incur higher borrowing costs (Pittman and Fortin 2004, Elliott et al. 2010). Pittman and Fortin (2004) find that firms with longer credit histories (*Firm Age*) and those audited by large auditors have a lower cost of debt. I control for Big 4 auditors because large auditors are generally associated with higher audit quality and higher earnings quality (Teoh and Wong 1993, Becker et al. 1998, Ghosh and Moon 2005).  $\Delta Firmsize$  and  $\Delta Leverage$  are included to control for shifts in asset and capital structure (Elliott et al. 2010).

*Bond issue characteristics: Maturity* is the natural logarithm of the number of years to maturity of the bond. *Subordinate*, *Put*, and *Call* are indicator variables equal to one for subordinated, puttable and callable bonds, respectively. *Offer Size* is the natural logarithm of bond issue size (denominated in millions of dollars). I expect that the numeric *Rating* increases with maturity, subordination status, issue size, and decreases with put and call provisions (e.g., Bhojraj and Sengupta 2003, Shi 2003).

For existing bonds trading in the secondary market in both years before and after the firms' first tabular disclosures, the influence of off-balance sheet obligations on credit risk could be a result of the change in the amount of these obligations rather than the change of the disclosure format. However, there is no uniform disclosure for all the off-balance sheet obligations prior to Rule FR-67, which could make the off-balance sheet obligations not directly observable before firms adopt tabular disclosures. Therefore, I use the firm-level debt ratings at

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<sup>16</sup> I do not have a prediction on the sign of *CUMRET* because stock returns could be either positively or negatively associated firm risk (Bhojraj and Sengupta 2003).

Year -1 to proxy for the off-balance sheet obligations at one year before the firm's first tabular disclosure and use a variation of equation (3):

$$\begin{aligned}
 \text{Rating}(\text{Negative Watch})_{+1} = & \beta_0 + \beta_1 \text{OBSSO} + \beta_2 \text{Leverage} + \beta_3 \text{Size} + \beta_4 \text{ROA} + \beta_5 \text{MB} + \beta_6 \text{CUMRET} \\
 & + \beta_7 \text{Beta} + \beta_8 \text{Earnings Volatility} + \beta_9 \text{Capital Intensity} + \beta_{10} \text{Cash Flow} \\
 & + \beta_{11} \text{Negative Equity} + \beta_{12} \text{Firm Age} + \beta_{13} \text{Big4} + \beta_{14} \Delta \text{Firm size} \\
 & + \beta_{15} \Delta \text{Leverage} + \beta_{16} \text{Debt Rating}_{-1} + \beta_{17} \text{Bond Age} + \beta_{18} \text{Maturity} \\
 & + \beta_{19} \text{Subordinate} + \beta_{20} \text{Put} + \beta_{21} \text{Call} + \beta_{22} \text{Amount Outstanding} \\
 & + \sum \text{Industry} + \varepsilon,
 \end{aligned} \tag{4}$$

where the Moody's rating is assigned to a given bond at one year after the fiscal-year end of Year 0; *Negative Watch* is an indicator variable equal to one if Moody's assigns a down watch to the bond in one year after the fiscal-year end of Year 0; *Debt Rating<sub>-1</sub>* is the S&P long-term debt rating assigned to the firm at one year before the fiscal-year end of the firm's first tabular disclosure; *Bond Age* is the natural logarithm of one plus the number of years between the bond's issue date and the fiscal-year end of Year 0; *Amount Outstanding* is the natural logarithm of the par amounts outstanding for each bond at the fiscal-year end of Year 0. All other variables are as defined before.

If rating agencies take off-balance sheet obligations disclosed under Rule FR-67 into consideration of credit risk, I expect bond ratings and the likelihood of negative credit watch to be positively associated with the off-balance sheet leverage after controlling for the previous ratings. I expect the coefficient on *Debt Rating<sub>-1</sub>* to be either positive or negative. If off-balance sheet obligations in Year 0 (*OBSSO<sub>0</sub>*) and Year -1 (*OBSSO<sub>-1</sub>*) are uncorrelated, both of them are expected to be positively associated with credit risk. In contrast, if *OBSSO<sub>0</sub>* and *OBSSO<sub>-1</sub>* are correlated, the one-year-ahead credit risk should increase with the incremental amount of off-balance sheet obligations (*OBSSO<sub>0</sub> - OBSSO<sub>-1</sub>*). Thus the coefficient on *Debt Rating<sub>-1</sub>*, a measure for



$OBSO_{-1}$ , is expected to be negative. Predictions for other coefficients in equation (4) parallel those in equation (3).

#### 4.3. Off-balance sheet obligations and bond-yield spreads

To examine the relation between bond-yield spreads and off-balance sheet obligations, I use corporate bond-yield spreads for newly issued (e.g., Shi 2003, Elliott et al. 2010) and existing bonds. *Bond-Yield Spreads* are defined as the corporate bond's yield-to-maturity minus yield on U.S. Treasury bond of comparable maturity on the bond's offering (trading) date (measured in basis points). To ensure that the tabular disclosures are available to bond holders, bond yield spreads are measured for the bonds issued (traded) during the twelve-month period starting from the fiscal-year end of Year 0. For existing bonds, I use *Debt Ratings*<sub>-1</sub> to measure off-balance sheet obligations in the previous year.

To examine whether off-balance sheet obligations are priced in public bond valuation, I use the following bond-level regression:

$$\begin{aligned}
 \text{Bond-yield Spreads} = & \beta_0 + \beta_1 OBSO + \beta_2 Leverage + \beta_3 Size + \beta_4 ROA + \beta_5 MB + \beta_6 CUMRET \\
 & + \beta_7 Beta + \beta_8 Earnings Volatility + \beta_9 Capital Intensity + \beta_{10} Cash Flow \\
 & + \beta_{11} Negative Equity + \beta_{12} Firm Age + \beta_{13} Big4 + \beta_{14} \Delta Firm size \\
 & + \beta_{15} \Delta Leverage + \beta_{16} Debt Rating_{-1} + \beta_{17} Bond Age + \beta_{18} Maturity \\
 & + \beta_{19} Subordinate + \beta_{20} Put + \beta_{21} Call + \beta_{22} Offer Size(Amount Outstanding) \\
 & + \beta_{23} ECYC + \sum Industry + \varepsilon.
 \end{aligned} \quad (5)$$

Similar to Shi (2003), I include *ECYC* measured as the average yield on Moody's Aaa bonds less the average yield on the 30-year U.S. Treasury bonds for the bond's issue month (trading year) to control for the macroeconomic conditions. I expect that *Bond-yield Spreads* increase with the time series variation of risk premiums over the business cycle (*ECYC*). All

other variables and predictions are the same as those for equations (3) and (4).<sup>17</sup> If bond holders perceive the risk of off-balance sheet obligations, the coefficient on *OBSO* ( $\beta_1$ ) is expected to be positive.

#### 4.4. Off-balance sheet obligations and private loan covenants

I examine the effect of off-balance sheet obligations on private lenders' assessment of credit risk through their usage of loan covenants. The number of covenants is measured at the inception of loans issued during one year starting from the fiscal-year end of Year 0. Following Chava and Roberts (2008) and Anantharaman et al. (2010), I identify 13 financial and one investment covenant types in private loan contracts with available firm and loan information.<sup>18</sup> Since covenants generally apply to all loans in a package (Chava and Roberts 2008), the number of covenants (*Covenants*) is counted at the package level.<sup>19</sup>

Because private lenders could have private information regarding off-balance sheet obligations before firms adopt Rule FR-67, I use *Debt Ratings*<sub>-1</sub> to measure the prior-year off-balance sheet obligations. Therefore, a variation of equation (4) is specified as the following equation:

$$\begin{aligned} \text{Covenants} = & \beta_0 + \beta_1 \text{OBSO} + \beta_2 \text{Leverage} + \beta_3 \text{Size} + \beta_4 \text{ROA} + \beta_5 \text{MB} + \beta_6 \text{CUMRET} + \beta_7 \text{Beta} \\ & + \beta_8 \text{Earnings Volatility} + \beta_9 \text{Capital Intensity} + \beta_{10} \text{Cash Flow} + \beta_{11} \text{Negative Equity} \\ & + \beta_{12} \text{Firm Age} + \beta_{13} \text{Big4} + \beta_{14} \Delta \text{Firm size} + \beta_{15} \Delta \text{Leverage} + \beta_{16} \text{Debt Rating}_{-1} \\ & + \beta_{17} \text{Deal Maturity} + \beta_{18} \text{Deal Amount} + \beta_{19} \text{Number of Lenders} + \sum \text{Industry} + \varepsilon, \quad (6) \end{aligned}$$

where *Deal Maturity* is the natural logarithm of a loan package's maturity in month; *Deal Amount* is the natural logarithm of a loan package's offering amount; *Number of Lenders* is the

<sup>17</sup> If there are multiple transactions for a given bond trading in the secondary market, *Bond-yield Spreads*, *Bond Age* and *Maturity* are weighted by the par amounts of each transaction.

<sup>18</sup> See Appendix D for a description of covenant types.

<sup>19</sup> The basic unit in DealScan is the loan facility. A loan package may contain more than one loan facility.

number of lenders for each loan package.<sup>20</sup> Following prior literature (e.g., Denis and Mihov 2003, Bradley and Roberts 2004, Anantharaman et al. 2010), I expect that larger syndicates write more covenants, thus the number of covenants is positively associated with the number of lenders of a loan package. All other variables and predications parallel those in equation (4). If private loan lenders consider the risk of off-balance sheet obligations in the tabular disclosures, they would write more covenant restrictions at the inception of the loan. Therefore, the coefficient on *OBSO* ( $\beta_1$ ) is expected to be positive.

To examine the relation between off-balance sheet obligations and the change in the number of covenants following tabular disclosures under Rule FR-67, I further replace the dependent variable (*Covenant*) in equation (6) with an indicator variable  $\Delta\left(\frac{Total\ Covenants}{Packages}\right)$ , which equals to one if there is an increase in the number of covenants following the firm's first tabular disclosure of contractual obligations. Because a firm can have different number of loan packages in different years, I deflate the number of covenants by the number of loan packages issued in the year.<sup>21</sup> If private lenders reassess credit risk following the tabular disclosures, the likelihood of an increase in covenants is expected to be positively associated with off-balance sheet obligations disclosed under Rule FR-67.

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<sup>20</sup> I do not include an indicator for subordination status because all loans in this sample are senior. If there are more than one loan facilities in a package, *Deal Maturity* is measured for the facility with the longest maturity.

<sup>21</sup> I do not include loan characteristics for this equation because the pre- and post-tabular disclosure periods cover different loan packages. *Debt Rating*<sub>-1</sub> is not included because the number of covenants at Year -1 captures the private lenders assessment of *OBSO*<sub>-1</sub>.

## 5. SAMPLE AND DATA COLLECTION PROCEDURE

Following earlier studies that use hand-collected data (e.g., Chen et al. 2008, Kohlbeck and Mayhew 2010, Conyon et al. 2011), I start with S&P 1500 companies (S&P 500, S&P MidCap 400 and S&P SmallCap 600). I limit the sample to S&P 1500 because: (1) the tabular disclosures of contractual obligations are not machine-readable and hand collecting the data from Form 10-Ks is time consuming; (2) S&P 1500 companies are selected from large, medium, and small firms, which represent approximately 90 percent of market capitalization of all publicly traded firms. Therefore, S&P 1500 companies provide a large enough sample to allow for adequate variance among firms, keeping the hand-collection work manageable.

I identify companies that make tabular disclosures on contractual obligations in the MD&A section of their annual reports via a SEC/EDGAR search beginning fiscal year 2000, using the following keywords: “contractual obligations,” “contractual cash obligations,” “commitments,” “contractual,” “payment,” and “borrowed funds.”<sup>22</sup> The SEC released the Commission Statement FR-61 on January 22, 2002 and suggested companies that were still

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<sup>22</sup> If no contractual obligation table is found using the keyword search, I read through the MD&A section. The identified contractual obligation tables in the sample are titled as: “contractual obligations,” “contractual cash obligations,” “contractual cash payment obligations,” “contractual cash flow commitments,” “minimum cash payment commitments,” “cash requirements,” “contractual payment obligations,” “contractual and contingent obligations,” “fixed obligations,” “fixed cash obligations,” “financial obligations,” “obligations,” “commitments,” “contractual commitments,” “contractual commitments and obligations,” “contractual cash commitments,” “contractual agreements,” “contractual and other obligations,” “contractual arrangements,” “contractual debt,” “debt and contractual financial obligations and commitments,” “debt and lease obligations,” “financial contracts and commitments,” “future commitments,” “future commitments under various contracts,” “future minimum lease payments,” “future obligations and commitments,” “future payments,” “future payments under current contracts,” “long-term borrowed funds,” “long-term obligations,” “long-term financial obligations,” “obligations and commitments,” “disclosure of financial obligations and contingent financial commitments,” “long-term debt, non-cancellable operating lease commitments for aviation equipment, bank borrowings and accounts receivable securitization,” “consolidated debt, lease and capital,” “contractual and commercial obligations,” “commitments and contingencies,” “mandatory financial obligations and commitments,” “financing obligations,” “commitments and pledged funds,” “long-term debt, leases and guarantees,” “obligations under operating leases, capital leases, notes payable and irrevocable letters of credit,” and “obligations for indebtedness and lease obligations.”

preparing their 2001 annual reports include a tabular presentation of contractual obligations in the MD&A section. I therefore examine each company from fiscal year 2000 to check whether it has made similar tabular disclosure prior to Commission Statement FR-61.<sup>23</sup> I find that the first tabular disclosure on contractual obligations occurred in annual reports for fiscal year ended with December 31, 2001 (filed on January 24, 2002), consistent with the expectation that certain companies made tabular disclosures as a response to Commission Statement FR-61, which predicts the release of Rule FR-67.

I search the SEC/EDGAR database for the firm's first adoption year of S&P 1500 companies from the 2011 S&P Index Constituent and S&P 500 companies from the 2003 S&P Index Constituent. Stock returns are collected from CRSP. Financial variables are collected from Compustat. Information on bonds and their ratings are collected from the Mergent Fixed Income Securities Database (FISD). Private loan data are collected from DealScan.<sup>24</sup> The detailed sample selection procedure is described in Table 1.

I exclude the following companies: one company filing 10-KSB, 3 companies with missing 10-K filings, 2 companies without tabular disclosures of contractual obligations in their MD&As, one company with missing CIK-GVKEY match, 3 companies with duplicated matches, and 7 companies missing total assets in Compustat. The sample used for a summary of off-balance sheet obligations as shown in Table 2 consists of 1,617 firms for their first year of tabular disclosures ranging from fiscal year 2001 to 2010.

To test debt valuation of off-balance sheet obligations in public bond market, I begin with the sample, which is included in the summary of off-balance sheet obligations in Table 2. The sample satisfies the additional requirements as follows: (1) to be included in the bond

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<sup>23</sup> If there is no disclosure in the firm's 2000 annual reports, I assume that there is no such disclosure in fiscal years prior to 2000.

<sup>24</sup> I match DealScan and Compustat using the link file provided by Michael Roberts and WRDS.

valuation tests, a firm must have at least one bond issued within one year beginning with the fiscal-year end of Year 0; (2) similar to Campbell and Taksler (2003) and DeFond et al. (2011), I exclude bond issues with asset-backed, secured and credit-enhancement features to ensure that the bonds are backed solely by the creditworthiness of the issuer;<sup>25</sup> (3) similar to Atilgan et al. (2011), I exclude OTC bond issues and private bonds issued under Rule 144A; (4) I limit the sample to include only nonconvertible bond issues with fixed interest rates and information on offering yields, offering amount, maturity, security status, callable and puttable features; and (5) bond yield spreads are winsorized at the 1 and 99 percent. This sample selection procedure results in 1,274 (5,024) newly issued (existing) bonds by 105 (352) firms.<sup>26</sup>

Similarly, to examine the effect of off-balance sheet obligations in the private loan market, I begin with the sample included in the summary of off-balance sheet obligations in Table 2 with the following additional requirements: (1) the firm must have at least one private loan issued within one year beginning with the fiscal-year end of Year 0; (2) non-U.S. dollar loan facilities are deleted; (3) I limit the sample to include loan packages with information on covenant type, maturity, offering amount, and number of lenders. This sample selection procedure results in 428 loan packages. I further eliminate 130 loan packages with missing debt ratings at Year -1 and get 298 (256) loan packages (firms).

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<sup>25</sup> The bond yield spread on asset-backed and secured bonds represents the creditworthiness of the collateral rather than that of the issuer (Campbell and Taksler 2003).

<sup>26</sup> Bond yields for existing bonds traded in the secondary market are collected from FISD-TRACE database, which covers historical time sales data from July 1, 2002. Therefore, firms with the first tabular disclosures in 2001 can be deleted due to data availability. Bond spread analysis for existing bonds covers 402 (151) bonds (firms) traded in the secondary OTC market.

## 6. EMPIRICAL RESULTS

### 6.1. Summary statistics

Table 2 presents the total amount of off-balance sheet obligations under each category and the summary statistics of variables indicating the importance of each obligation (as a percentage of total assets).<sup>27</sup> I find that other contractual agreements and commitments have the largest amount (\$1,033 billion), followed by purchase obligations (\$648 billion), lines of credit (\$593 billion), operating leases (\$439 billion), and letters of credit (\$182 billion), suggesting that these five categories may have the most significant effects on firms' liquidity and capital resources. Regarding the number of firms in each category, operating leases are the most prevalent type of off-balance sheet obligations, followed by purchase obligations, letters of credit, other contractual agreements and commitments, and guarantees.

Table 3 presents descriptive statistics.<sup>28</sup> Panel A represents distributional statistics for off-balance sheet obligations and firm characteristics for a sample of 1,617 companies. *OBSO*, *Purchase Obligation*, *Operating Lease*, and *Other OBSO* are measured for Year 0, with means of 0.078, 0.024, 0.037, and 0.017, respectively. Panel B presents Moody's ratings (mean = 2.56; median = 1) and offering-yield spreads (mean = 99.394; median = 91) for newly issued bonds. Panel C presents the one-year-ahead Moody's ratings (mean = 4.772; median = 1) and an indicator variable for negative credit watch (mean = 0.119; median = 0), while Panel D presents the bond-yield spreads (mean = 148.596; median = 91.132) for existing bonds trading in the secondary market in one year after the fiscal-year end of Year 0. Panel E presents the covenant and loan characteristics for private loans. The median firm has two total (financial) covenants.

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<sup>27</sup> Similar to Graham et al. (1998), off-balance sheet obligations are measured as the present value discounted at an interest rate of 10 percent.

<sup>28</sup> Appendix E provides variable definitions.

## 6.2. Off-balance sheet obligations and credit ratings

Table 4 reports the ordered-probit-regression results from estimating equation (3) using Moody's rating for newly issued bonds to measure credit risk. I focus on the estimated coefficients on *OBSO* to examine the risk relevance of the off-balance sheet obligations, which are positive and significant before (coeff.= 12.449, z-stat. = 4.42) and after (coeff.= 13.893, z-stat. = 4.93) controlling for bond characteristics.<sup>29</sup> The first two sets of columns of Table 4 also indicate that the coefficients on on-balance sheet *Leverage* are significantly positive, as expected, while those on *Size* and *ROA* are significantly negative (all *p*-values < 0.05). The results reveal that credit ratings for newly issued bonds capture the risk-relevant information associated with off-balance sheet obligations.

The third set of columns in Table 4 presents the regression results for equation (3) after partitioning off-balance sheet obligations into *Purchase Obligation*, *Operating Lease*, and *Other OBSO* to show the effect of each component on credit ratings. The coefficients on *Purchase Obligation* (coeff. = 16.386, z-stat. = 4.65) and *Other OBSO* (coeff. = 14.217, z-stat. = 3.22) are both significantly positive, suggesting that purchase obligations and other off-balance sheet obligations have marginal explanatory power in addition to operating leases that were previously disclosed in a tabular format.<sup>30</sup> Further, the untabulated *F*-test indicates that the difference between the coefficients on *Purchase Obligation* and *Other OBSO* is statistically insignificant (*p*-value = 0.679).

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<sup>29</sup> Because of the multiple-outcome feature of the ordered-probit model, I examine the marginal effects for the median outcome at *Rating* equal to 1 ("Aaa"). The untabulated results show that if there is a one-percent increase in *OBSO*, the probability of Moody's "Aaa" rating decreases by 2.06 (2.40) percent before (after) controlling for bond characteristics.

<sup>30</sup> The untabulated marginal effects show that a one-percent increase of *Purchase Obligation* (*Other OBSO*) is associated with a 2.78 (2.41) percent decrease in the probability of Moody's "Aaa" rating.



Table 5 presents the ordered-probit-regression results for equation (4) using Moody's rating for existing bonds to measure credit risk. Similar to results in Table 4, the coefficient on *OBSO* is significant and positive (coeff. = 9.785, z-stat. = 5.92). When I decompose *OBSO* into *Purchase Obligation*, *Operating Lease*, and *Other OBSO*, the coefficients on all the three components are significant and positive (coeff. = 10.040, z-stat. = 4.87; coeff. = 5.871, z-stat. = 2.40; and coeff. = 10.959, z-stat. = 5.02, respectively).<sup>31</sup> The untabulated *F*-tests indicate that the coefficient on *Purchase Obligation* is insignificantly different from those on *Operating Lease* (*p*-value = 0.154) and *Other OBSO* (*p*-value = 0.711). However, after controlling for the prior-year debt rating (*Debt Rating-1*), the third set of columns reveals that the coefficients on *Purchase Obligation* and *Operating Lease* are not significantly different from zero, but the coefficient on *Other OBSO* is still significant and positive (coeff. = 7.351, z-stat. = 4.13). The significance and signs of the coefficients on on-balance sheet leverage, size, and ROA are similar to those in Table 4. These results indicate that credit risk as reflected in credit ratings is associated with the level but not the potential change of purchase obligations after controlling for operating leases and other off-balance sheet obligations.

I then use the likelihood of negative credit watch to measure credit risk and report the logistic regression results for equation (4) in Table 6. The coefficient on off-balance sheet obligations (*OBSO*) is significant and positive (coeff. = 8.085, z-stat. = 3.27), indicating that at the median of *OBSO* (0.042) in Panel A of Table 3, a one-percent increase in *OBSO* is associated with a 0.1 percent increase in the probability of negative credit watch.<sup>32</sup> The coefficient on *OBSO* is significant and positive (coeff. = 11.596, z-stat. = 3.49) after including *Debt Rating-1*. The coefficients on *Purchase Obligation* (coeff. = 13.889, z-stat. = 3.60) and *Other OBSO* (coeff.

<sup>31</sup> The untabulated marginal effects show that a one-percent increase of *OBSO* (*Purchase Obligation*) is associated with a 3.61 (3.72) percent decrease in the probability of Moody's "Aaa" rating.

<sup>32</sup>  $[1 + e^{(-8.085*0.042)}] / [1 + e^{(-8.085*0.042*1.01)}] - 1 = 0.001$ .

= 11.531,  $z$ -stat. = 2.83) are both significant and positive after controlling for operating leases. The untabulated  $F$ -test indicates that the difference between the two coefficients is statistically insignificant ( $p$ -value = 0.544).

Therefore, these findings suggest that credit rating agencies do take firms' off-balance sheet obligations into account when developing credit ratings. That I do not find a significant effect of purchase obligations on credit ratings after controlling for the prior-year ratings, but a significant effect on the likelihood of negative credit watch may suggest that credit watch actions are more timely in reflecting the firms' credit risk associated with purchase obligations than are rating actions.

### 6.3. Off-balance sheet obligations and bond yield spreads

Table 7 reports the results from estimating equation (5) using bond yield spreads for newly issued bonds to measure credit risk. The results in Table 7 reveal that off-balance sheet obligations and the control variables explain 53 percent of the variations in bond spreads. The first column shows that the coefficient on *OBSO* is significant and positive (coeff. = 519.508,  $t$ -stat. = 4.65). Together with the standard deviation of 0.097 for *OBSO* in Table 3, this coefficient indicates that a one-standard-deviation difference in off-balance sheet obligations is associated with a 50-basis-point difference in bond spreads (519.508 times 0.097 = 50.392).<sup>33</sup>

The second column in Table 7 presents the results after decomposing *OBSO* into *Purchase Obligation*, *Operating Lease*, and *Other OBSO*. Again, the coefficient on *Purchase Obligation* is significant and positive (coeff. = 527.020,  $t$ -stat. = 5.19). The untabulated  $F$ -test indicates that the difference between the coefficients on *Purchase Obligation* and *Operating Lease* is statistically insignificant ( $p$ -value = 0.312). This result indicates that the bond market

<sup>33</sup> The standard deviation of *OBSO* for the sample used in Table 7 is 0.056, which indicates that a one-standard-deviation difference in off-balance sheet obligations is associated with a 29-basis-point difference in bond spreads (519.508 times 0.056 = 29.092).

views purchase obligations and operating leases as equally relevant to firms' credit risk. The significance and signs of the coefficients on control variables for firm (e.g., on-balance sheet leverage, size, ROA, market-to-book ratio, and market beta), bond issue (e.g., maturity, seniority, and put), and the macroeconomic characteristics (*ECYC*) are largely consistent with the predictions.

Table 8 presents the results from estimating equation (5) using bond-yield spreads for bonds trading in the secondary market. The results are largely similar to those reported in Table 7. Specifically, the coefficient (748.522) on *OBSO* together with the standard deviation of *OBSO* (0.097) indicates that a one-standard-deviation difference in off-balance sheet obligations is associated with a 73-basis-point difference in bond spreads (748.522 times 0.097).<sup>34</sup> The coefficient on *OBSO* is still significant and positive (coeff. = 448.976, *t*-stat. = 2.12) after controlling for the prior-year ratings, suggesting that a one-percent increase in off-balance sheet obligations is associated with a 4.5 percent increase in bond spreads. The coefficient on *Purchase Obligation* (coeff. = 492.259, *t*-stat. = 2.16) is significant and positive but the coefficients on *Operating Lease* and *Other OBSO* are insignificant after controlling for the prior-year ratings, indicating that only purchase obligations provide new information to the secondary bond market.

#### 6.4. Off-balance sheet obligations and private loan covenants

Table 9 presents the ordered-probit-regression results from estimating equation (6) using the number of private-loan covenants to measure credit risk. The first set of columns reveals that the coefficient on *OBSO* is significant and positive (coeff. = 3.089, *z*-stat. = 2.80), suggesting that lenders tend to write more covenants (including financial and net worth covenants) in credit

<sup>34</sup> The standard deviation of *OBSO* for the sample used in Table 8 is 0.064, which indicates that a one-standard-deviation difference in off-balance sheet obligations is associated with a 48-basis-point difference in bond spreads (748.522 times 0.064 = 47.91).

agreements with borrowers that have more off-balance sheet obligations.<sup>35</sup> After controlling for the prior-year ratings, the second and third sets of columns reveal that the coefficients on *Purchase Obligation* (coeff. = 2.602, z-stat. = 2.05 for *Total Covenants*; coeff. = 3.088, z-stat. = 2.24 for *Financial Covenants*) and *Other OBSO* (coeff. = 4.093, z-stat. = 2.18 for *Total Covenants*; coeff. = 4.159, z-stat. = 2.26 for *Financial Covenants*) are significant and positive, but the coefficients on *Operating Lease* are statistically insignificant. The untabulated *F*-tests indicate that the coefficients on *Purchase Obligation* and *Other OBSO* are not statistically different (*p*-values = 0.482 and 0.611 for the second and third regressions).

For a sample of firms with new loans during one year before and after their first tabular disclosures of contractual obligations, Table 10 presents the logistic regression results from estimating a variation of equation (6).<sup>36</sup> Credit risk is measured as the likelihood of an increase in the number of covenants after the firms' first tabular disclosures. The first set of columns reveals that the coefficient on *OBSO* is significant and positive (coeff. = 7.927, z-stat. = 2.34). The second set of columns further reveals that this significant relation is only attributable to *Purchase Obligation* (coeff. = 9.907, z-stat. = 2.85).<sup>37</sup> Taken together, these findings suggest that the private loan lenders take off-balance sheet obligations, especially purchase obligations, into account when assessing the borrowers' credit risk.

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<sup>35</sup> The untabulated marginal effects indicate that a one-percent increase of *OBSO* is associated with a 0.89 percent increase in the probability of receiving more than one covenant.

<sup>36</sup> The variable *Negative Equity* is excluded because no firm in this sample has negative book value of common equity.

<sup>37</sup> At the means of purchase obligations (0.024), a one-percent increase in purchase obligations is associated with a 0.1-percent increase in the likelihood of receiving more covenants after the firms' first tabular disclosures.

## 7. ADDITIONAL ANALYSES

### 7.1. S&P long-term debt ratings

Similar to Barth et al. (2012) and Ghosh and Moon (2005), Table 11 presents the ordered-probit-regression results from estimating a variation of equation (4) using the one-year-ahead S&P long-term debt ratings to measure the firm-level credit ratings. Similar to the results in Table 5, the first set of columns reveals that the coefficient on *OBSO* is positive and significant (coeff. = 4.300, *z*-stat. = 7.06). The second and third sets of columns present results after controlling for the ratings measured at one year prior to the fiscal-year end of the firms' first tabular disclosures. The coefficients on *Purchase Obligation*, *Operating Lease*, and *Other OBSO* (1.770, 5.563, and 3.981, respectively) are all significant. These results are consistent with previous findings that credit rating agencies assess firms' credit risk associated with off-balance sheet obligations.

### 7.2. Non-linear effect of off-balance sheet obligations on credit risk

Prior literature documents a nonlinear relation between firm value and debt value (e.g., Elliott et al. 2010). When default risk is low, debt holders can get their *fixed* contractual payments independent of the payments to other contractors. Huang and Huang (2002) find that credit risk accounts for only a small fraction of the corporate bond-yield spreads for investment-grade bonds and accounts for a much higher fraction for junk bonds. Therefore, to minimize the possibility that my results are driven by firms with high default risk, I partition the sample into investment- and noninvestment-grade firms and repeat the tests in Tables 4 through 10. The results (untabulated) indicate that, while firms' credit risk is more sensitive to off-balance sheet

obligations for noninvestment-grade firms, off-balance sheet obligations also explain a significant amount of credit risk for investment-grade firms.<sup>38</sup>

In addition, I partition the sample into above- (“High”) and below-median (“Low”) off-balance-sheet obligation groups and repeat the analyses in Tables 4 through 10. The results (untabulated) for the “High” group are largely consistent with the main results, but the coefficients on off-balance sheet obligations are mostly insignificant for the “Low” group. These results indicate that the disclosures under Rule FR-67 are more relevant to debt market participants’ assessment of credit risk for firms with high off-balance sheet obligations.

### 7.3. Controlling for endogeneity

Firms disclosing high off-balance sheet obligations are likely to systematically differ from those disclosing sporadic off-balance sheet obligations. For example, Mills and Newberry (2005) find that credit-constrained firms are more likely to use off-balance sheet financing to access lower-cost financing sources or avoid covenant violations. Therefore, I adopt a two-stage-least-squares (2SLS) approach to correct for the endogeneity problem (if any) induced by the self-selection bias. Specifically, I conjecture that riskier firms are more likely to use off-balance sheet obligations.

Table 12 presents the 2SLS regression results for equations (3) through (6), where off-balance sheet obligations are treated as endogenously determined. The first-stage regression results in the first model indicate that firms with higher systematic risk (*Beta*), higher operating risk (*Earnings Volatility*), inferior long-term debt ratings, greater operating cash flow, lower ROA, less change in firm size ( $\Delta Firmsize$ ) and leverage ( $\Delta Leverage$ ), and firms hiring Big 4

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<sup>38</sup> Moody’s (S&P) ratings lower than or equal to Ba1 (BBB) are classified in the noninvestment-grade category. The coefficients on *OBSO* for investment-grade groups are statistically significant at (or above) the 10% level.

auditors at Year -1, disclose more off-balance sheet obligations.<sup>39</sup> The second-stage results across all the seven models are qualitatively similar to the primary results.<sup>40</sup>

#### 7.4. Controlling for off-balance sheet obligations at Year -1

The influence of off-balance sheet obligations reported in the firm's first tabular disclosure on credit risk could be attributable to the increase in off-balance sheet obligations from Year -1 to Year 0. If the tabular disclosure is informative, then a firm may also experience an increase in credit risk after controlling for the amount of off-balance sheet obligations in the pre-tabular disclosure period.<sup>41</sup>

I hand collect off-balance sheet obligations from annual footnote disclosures for Year -1. Table 13 presents the OLS regression results for 107 public bonds (issued by 70 firms) trading in the secondary market in both Years -1 and 0. The dependent variables are the natural logarithm of bond-yield spreads and the Moody's ratings, respectively.<sup>42</sup> *OBSO* is measured as the present value of total off-balance sheet obligations, deflated by the firm value at the fiscal year end. The present value of operating leases for Year -1 is calculated using Compustat items #96, #164, #165, #166, #167, and #389. The present value of operating leases for Year 0 is calculated using data from the firm's first tabular disclosure. Purchase obligations and other off-balance sheet

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<sup>39</sup> The first-stage regression results (untabulated) for the other six models are largely consistent with those for the first model.

<sup>40</sup> The results (untabulated) are consistent with the primary results when *Purchase Obligations*, *Operating Lease*, and *Other OBSO* are treated as endogenous simultaneously.

<sup>41</sup> I expect the coefficient on  $OBSO_{-1}$  to be either positive or negative. If  $OBSO_0$  and  $OBSO_{-1}$  are uncorrelated, both of them are expected to be positively associated with credit risk. In contrast, if the one-year-ahead credit risk increases with the incremental disclosure of off-balance sheet obligations ( $OBSO_0 - OBSO_{-1}$ ), the coefficient on  $OBSO_{-1}$  is expected to be negative.

<sup>42</sup> I take a log transform of bond-yield spreads to mitigate the potential influence of outliers in the small sample.

obligations are collected from firms' first tabular disclosures of contractual obligations for Year 0 and from footnote disclosures of commitments and contingencies for Year -1.<sup>43</sup>

The coefficients on  $OBSO_0$  are significant and positive (coeff. = 14.335,  $t$ -stat. = 2.79 for bond-yield spreads; coeff. = 97.273,  $t$ -stat. = 5.23 for Moody's ratings) after controlling for off-balance-sheet obligations at Year -1. These results reveal that off-balance-sheet obligations disclosed under Rule FR-67 capture risk-relevant information incremental to on-balance sheet liabilities and obligations previously disclosed in annual footnotes.

### 7.5. Credit risk and off-balance sheet obligations in pre- and post-tabular disclosure periods

Using a sample of 38 firms with non-zero purchase obligations, I compare the effect of off-balance-sheet obligations on credit risk in periods before and after the first tabular disclosures through the following equation:

$$\begin{aligned} \ln(\text{Bond - yield spreads})_{+1} = & \beta_0 + \beta_1 \text{Purchase Obligation} + \beta_2 \text{Purchase Obligation} \times \text{POST} \\ & + \beta_3 \text{Operating Lease} + \beta_4 \text{Operating Lease} \times \text{POST} \\ & + \beta_5 \text{Other OBSO} + \beta_6 \text{Other OBSO} \times \text{POST} + \beta_7 \text{Leverage} \\ & + \beta_8 \text{Leverage} \times \text{POST} + \beta_9 \text{Size} + \beta_{10} \text{Size} \times \text{POST} \\ & + \beta_{11} \text{POST} + \sum \text{Bond Characteristics} + \sum \text{Industry} + \varepsilon, \end{aligned} \quad (7)$$

where  $POST$  is a dichotomous variable equal to one for Year 0 and zero for Year -1. Credit risk is measured as the natural logarithm of the one-year-ahead bond-yield spreads. If the tabular disclosure provides additional information, the effect of off-balance-sheet obligations on credit risk is expected to be stronger in the post-tabular disclosure period than in the pre-tabular disclosure period.

Table 14 presents results for the comparison of bond-yield spreads' sensitivity to purchase obligations, operating leases, and other off-balance sheet obligations.<sup>44</sup> The first set of

<sup>43</sup> If the payment schedule is not disclosed, I assume the obligation is paid in one year.

<sup>44</sup> *Put* is not included in the regression because no bond is puttable in this sample.



columns presents the pooling regression results without including the *POST* indicator. The coefficient on *Operating Lease* is significantly positive (coeff. = 22.035, *t*-stat. = 5.46), but the coefficients on *Purchase Obligation* and *Other OBSO* are insignificant, suggesting that operating leases have stronger effect on the one-year-ahead bond-yield spreads than purchase obligations and other off-balance sheet obligations when footnote disclosures are included.

The second set of columns presents results after including the interaction of off-balance sheet obligations and the *POST* indicator. The coefficients on *Purchase Obligation* × *POST* (coeff. = 3.141, *t*-stat. = 2.08) and *Other OBSO* × *POST* (coeff. = 38.976, *t*-stat. = 2.63) are significant and positive, but the coefficient on *Operating Lease* × *POST* (coeff. = -14.512, *t*-stat. = -2.83) is significant and negative. The coefficient on the level of operating leases is significant and positive, but the coefficient is insignificant on the level of purchase obligations and negative on other off-balance sheet obligations. Accordingly, purchase obligations and other off-balance sheet obligations disclosed in the tabular format under Rule FR-67 have stronger effect on the one-year-ahead bond-yield spreads than those disclosed in footnotes. However, credit risk is more sensitive to the footnote disclosures of operating leases in the pre-tabular disclosure period than to the disclosures in the post-tabular disclosure period. This result is consistent with my expectation that tabular disclosures of operating leases under Rule FR-67 provide little information because operating leases were largely disclosed in a tabular format in previous annual footnotes.

#### 7.6. Other robustness tests

The results are largely similar when (1) the on- and off-balance sheet obligations are scaled by the market value of equity; (2) OLS regressions are used for testing credit ratings, negative credit watch, and debt covenants; (3) bonds and loans issued between the fiscal-year

end and the 10-K filing date are deleted to address the concern that off-balance sheet information may not be publicly available before the filing date; (4) regressions are repeated for the firms' first bonds or loans issued in the sample period;<sup>45</sup> (5) industry indicators are excluded; or (6) offering or trading month indicators are included .

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<sup>45</sup> I also include an indicator for the first bond or loan of each firm and interact it with *OBSO*. There is no evidence to show that the effect of off-balance sheet obligations on credit risk is stronger for the first bond or loan issued in the sample period.

## 8. CONCLUSION

The SEC suggested registrants disclose all material contractual obligations and commercial commitments in a single location within the MD&A section in annual reports (SEC 2002) and mandated a 2003 compliance date in Rule FR-67 (SEC 2003). Moreover, Rule FR-67 imposed new disclosure requirements on purchase obligations that were not required before. In this study, using a collection of off-balance sheet items disclosed under Rule FR-67, I highlight the importance of disclosures in assessing firms' credit risk.

Specifically, I examine whether the debt market participants take the tabular disclosure of off-balance sheet obligations into account in their assessment of credit risk. I measure credit risk as: (1) Moody's bond ratings, (2) the likelihood of negative credit watch, (3) bond-yield spreads, and (4) the number of covenants in private loan contracts. The results show that credit rating agencies, bond holders, and loan lenders do value the off-balance sheet information contained in the disclosure under Rule FR-67 when assessing firms' credit risk. Further, when I partition the aggregated off-balance-sheet obligations into three components, purchase obligations, operating leases, and all other off-balance-sheet obligations, I find that purchase obligations have significant explanatory power for bond-yield spreads, credit rating/watch actions, and private loan covenants.

In addition, I compare the effect of off-balance-sheet obligations on bond-yield spreads in periods before and after the first tabular disclosures, using a pilot sample of firms with non-zero purchase obligations.<sup>46</sup> I find that purchase obligations and other off-balance sheet obligations

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<sup>46</sup> I also find (untabulated) that equity risk (i.e., market beta, standard deviation of stock returns, and book-to-market ratio) is significantly positively associated with the present value of off-balance sheet obligations disclosed under Rule FR-67. In a pilot-sample study consisting of 100 largest firms that have purchase obligations and operating leases in both pre- and post-tabular disclosure periods, I find

disclosed under Rule FR-67 have stronger effect on the one-year-ahead bond-yield spreads than those disclosed in footnotes, suggesting that tabular disclosures of these obligations are more effective and efficient in conveying information than textual footnote disclosures. In contrast with purchase obligations and other off-balance sheet obligations, operating leases were largely disclosed in a tabular format in previous annual footnotes. Therefore, tabular disclosures of operating leases under Rule FR-67 provide little information in addition to footnote disclosures.

This evidence should be of interest to regulators, investors and creditors, especially after the financial crisis of 2008, which is viewed as triggered by financial institutions' use of off-balance-sheet financing vehicles, such as structured investment vehicles, special purpose entities, and conduits. This study could also have implications for the present debate on to what extent off-balance sheet items should be recognized on the balance sheet. My results could be interpreted as providing support for the FASB's latest off-balance-sheet disclosure requirements (FASB 2011) to disclose both net and gross information for certain assets and liabilities that are offset on balance sheet under U.S. GAAP.

Nonetheless, I need to add two important caveats. First, the incremental effect of off-balance-sheet obligations on credit risk in the post-tabular disclosure period could be a result of either the increase of the amount of off-balance sheet obligations or the change of disclosure format, or both. However, there is no uniform disclosure for all the off-balance sheet obligations prior to Rule FR-67, which could make the off-balance sheet obligations not directly observable before firms adopt tabular disclosures. Second, I collect off-balance sheet obligations from previous annual footnotes for 70 firms with public bonds trading in the secondary market in both

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(untabulated) that the effect of off-balance sheet obligations on equity risk is stronger in the post-tabular disclosure period than in the pre-tabular disclosure period.

pre- and post-tabular disclosure periods. Results from a larger sample may have additional insights.

## APPENDIX A

### An example of credit agreements with negative covenants on off-balance sheet obligations

THIS AMENDED AND RESTATED CREDIT AGREEMENT (the “Agreement”) is made and dated as of the 30th day of September, 2004 by and among BANK OF THE WEST (“Bank of the West”), as agent (in such capacity, the “Administrative Agent”) and Issuing Bank, Bank of the West and the other Lenders from time to time party hereto (each a “Lender” and, collectively, the “Lenders”), the Lenders, AMVAC CHEMICAL CORPORATION, a California corporation (the “Borrower”), AMERICAN VANGUARD CORPORATION, a Delaware corporation (“American Vanguard”), GEMCHEM, INC., a California corporation (“GemChem”), and 2110 DAVIE CORPORATION, a California corporation (“2110 Davie”) (American Vanguard, GemChem and 2110 Davie being the Guarantors (as such term and other capitalized terms used, but not otherwise defined, in this Agreement are defined in Paragraph 14 of this Agreement)).

...

**10. Negative Covenants.** The Borrower and each Guarantor hereby agrees that, as long as any Obligations remain unpaid or any Lender has any obligation to advance its Percentage Share of Loans or issue Letters of Credit hereunder, neither the Borrower nor any Guarantor shall, nor will it permit any of its Subsidiaries, directly or indirectly to:

- 10(a) Liens. ...
- 10(b) Indebtedness. ...
- 10(c) Consolidation and Merger. ...
- 10(d) Acquisitions. ...
- 10(e) Investments; Advances. ...
- 10(f) Sale of Assets. ...
- 10(g) ERISA. ...
- 10(h) Financial Covenants. ...
- 10(i) Capital Expenditures. ...
- 10(j) Hedge Agreements. ...
- 10(k) Transactions with Affiliates; Creation of Subsidiaries.

**(1) Enter into any transaction (including, without limitation, the purchase or sale of any property or service)** with, or make any payment or transfer to, any Affiliate except in the ordinary course of business and pursuant to the reasonable requirements of the Borrower’s and Guarantors’ business and upon fair and reasonable terms no less favorable to the Borrower or such Guarantor than would be obtainable in a comparable arms-length transaction;

...

**APPENDIX B**  
**An example of tabular disclosures of contractual obligations in MD&A**

**Panel A: AT&T Wireless Services (Contractual obligations as of December 31, 2002)**

(In millions)	Total	Payments Due by Period <sup>(1)</sup>			
		Less than 1 year	2-3 years	4-5 years	After 5 years
Operating leases <sup>(2)</sup>	\$ 2,754	\$ 611	\$ 1,040	\$ 557	\$ 546
Dedicated leased lines <sup>(3)</sup>	617	198	317	102	—
Purchase obligations <sup>(4)</sup>	1,689	162	1,302	225	—
Long-term debt <sup>(5)</sup>	10,836	—	250	1,886	8,700
Obligation related to ANW venture agreement <sup>(6)</sup>	145	—	—	145	—
Mandatorily redeemable preferred stock <sup>(7)</sup>	857	—	—	—	857
<b>Total contractual cash obligations</b>	<b>\$ 16,898</b>	<b>\$ 971</b>	<b>\$ 2,909</b>	<b>\$ 2,915</b>	<b>\$ 10,103</b>

- (1) Payments are included in the period by which they are contractually required to be made. Actual payments may be made prior to the contractually required date.
- (2) These commitments are associated with contracts that expire in various years through 2035. Payments due reflects fixed rent expense.
- (3) Represents our commitments with our primary local exchange carriers for dedicated leased lines. See Note 20 to our consolidated financial statements.
- (4) Unconditional purchase obligations include commitments to purchase network equipment and handsets related to the development of our next-generation strategy and commitments to purchase certain long-distance and network data services under our Master Carrier Agreement with AT&T. See Note 20 to our consolidated financial statements.
- (5) Amounts are equal to the annual maturities of our long-term debt outstanding as of December 31, 2002.
- (6) Represents our obligation associated with ANW's other owners' rights to require us to purchase their interests in ANW. See "Capital Requirements — Spectrum" above for further discussion of our venture agreement with ANW.
- (7) This commitment represents the total liquidation preference upon redemption (December 13, 2020) of the mandatorily redeemable preferred stock we issued in conjunction with the acquisition of TeleCorp. See Note 16 to our consolidated financial statements.

## APPENDIX B

### An example of tabular disclosures of contractual obligations in MD&A (continued)

#### Panel B: Calculating present value of future off-balance-sheet obligations

(in millions of U.S. dollars)	Payments Due By Period				Simple sum	Present value at Year 0
	Less than 1 year	2-3 years	4-5 years	5+ years		
Operating leases	611	1,040	557	546	2,754	2,104
Dedicated leased lines	198	317	102	0	617	512
Purchase obligations	162	1,302	225	0	1,689	1,377
Obligation related to ANW venture agreement	0	0	145	0	145	99
<b>Total off-balance-sheet contractual cash obligations</b>	<b>971</b>	<b>2,659</b>	<b>1,029</b>	<b>546</b>	<b>5,205</b>	<b>\$4,091</b>

*Notes:* AT&T Wireless Services's off-balance-sheet contractual obligations as of fiscal year December 31, 2002 are shown in the above table. The interest rate is 10%. The number of years for the period less than 1 year is rounded to one year. The number of years for the period of 2-3 years is rounded to two years. The number of years for the period of 4-5 years is rounded to four years. Number of years thereafter is assumed to be six years. Accordingly, the present value of total off-balance-sheet contractual obligations at the end of Year 0 is calculated using the following formula:

$$PV_{OBSO,0} = \frac{OBSO_1}{1.1} + \frac{OBSO_2}{1.1^2} + \frac{OBSO_4}{1.1^4} + \frac{OBSO_6}{1.1^6} .$$



## APPENDIX C

### Firm-specific off-balance sheet obligation items

#### Operating leases

- operating leases
- annual rental commitments under non-cancelable leases
- amounts receivable under noncancelable subleases
- dedicated leased lines
- secondary lease obligations
- headquarters building lease
- off-balance-sheet portion of capital lease obligation
- projected annual operating costs (related to operating leases)
- capital projects (related to operating leases)
- ground leases
- rent on facilities
- auto leases

#### Purchase obligations

- accrued license obligations
- advertising commitments
- broadcast rights
- capital expenditures
- cash award program
- charges recoverable
- coal reserve litigations
- commission obligation payments
- communication and quote minimum commitments
- computer support services
- consent decree payment
- construction commitments
- construction contracts for capital assets
- content rights
- contingent purchase price
- customer advances
- data processing and maintenance commitments
- data processing agreement obligations
- decommissioning of nuclear generating units
- deferred installment obligation
- demand charges
- development commitments
- distribution and satellite transmission (programming) rights
- drilling obligations
- electric settlement agreement
- employment contract
- employment agreements
- energy purchase obligations
- entertainment obligations
- equipment agreements
- equity compensation
- executive officers' employment agreements
- executives' separation agreements
- exploration rights
- facilities expansion
- federal tobacco buyout obligations
- financial arrangement
- fuel purchase obligations
- future land acquisitions
- gas energy safety program
- guaranteed minimum franchise payments
- headquarters building expansion
- infrastructure improvement contractual obligations
- international commitments
- IT / professional services
- layoff and impairment payments
- lease buy-out commitments
- lease purchase exercise
- legal settlements
- license agreement
- license guarantees
- long-term incentive obligations
- management agreement
- management fees
- manufacturing services
- marketing commitments
- merchandise agreement
- merchandise purchase obligations
- network launch incentives
- noncompetition agreements
- non-recurring engineering expenditures
- obligations related to international concessions
- obligations to contractors / suppliers / consumer
- obligations to unconsolidated affiliates
- obligations under affinity and co-brand programs
- open purchase orders
- operating service agreements
- other commodity commitments
- other purchase commitments
- programming and production deals
- purchase commitments
- purchase obligations
- outsourcing
- potential storage obligations
- pouring and vending rights
- producing property remediation
- purchase power buy-out obligation
- purchased power
- raw material contingent payment
- raw material supply agreement
- rental car repurchases
- replacement facilities
- research and development arrangement
- retention programs, royalty arrangements
- selling, general and administrative
- settlement agreements
- severance associated with workforce reductions
- severance obligations
- site maintenance fees
- software license agreements
- sponsorship agreements
- sports programming commitments
- stadium naming rights
- storage contract
- subsidiary facility lease and purchase commitment
- subsidiary land use rights
- supply agreement
- surplus properties
- take-or-pay contracts
- talent contracts
- tax audit settlements
- telecommunications and network agreement
- third party hosting arrangements
- timber obligations
- transportation obligations
- unfunded tenant improvement
- unrecognized tax obligations
- unrecorded employment contract
- vendor obligations

**APPENDIX C**  
**Firm-specific off-balance sheet obligation items (continued)**

**Letters of credit**

- letters of credit
- standby letters of credit

**Other contractual agreements and commitments**

- other contractual commitments
- restricted cash
- non-recourse debt
- other agreements
- liabilities' post-closing advance
- common stock repurchase agreement
- endorsement contract
- unfunded loans
- unfunded commitments
- lending commitments
- other commitments
- loan and lease commitments
- postretirement benefits in commitments and off-balance sheet arrangements
- antitrust fine
- standby repurchase obligations
- hedging contracts
- credit card commitments
- financial responsibility bonds
- transactions with recourse
- work commitments
- capital obligations
- interest premiums on redemption of preferred securities of subsidiary trusts
- purchases of loans
- purchases of mortgage-backed securities
- stock liability

**Guarantees**

- guarantees
- surety bonds
- residual value guarantees
- indemnities
- derivative contracts as guarantees
- custody securities lent with indemnification
- lease guarantee
- representations and warranties

**Lines of credit**

- lines of credit
- drawn line of credit
- revolving lines of credit

**Interest obligations**

- interest on long-term debt
- interest on debt obligations
- interest on capital lease obligation
- interest on lines of credit
- interest on senior convertible debentures
- interest payments on short-term borrowings
- interest obligation on transition property securitization
- mortgage interest

**Variable interest entities**

- sale leaseback obligations
- share of mortgage debt of unconsolidated joint ventures
- joint venture obligations
- acquisition of joint venture interest
- partnership investment
- share of operating lease of unconsolidated joint ventures
- synthetic lease obligation
- interest on guaranteed beneficial interests in the company's subordinated debentures
- funding commitments
- equity investments
- capital commitment
- equity security units
- other equity commitments
- equity support agreements
- long-term financing commitment under arrangement
- commitments to purchase when-issued securities
- commitments to sell when-issued securities
- limited partnerships
- share of secured debt of unconsolidated partnership
- tenant obligations (VIE leases)
- minority interest put right in operating units
- campus lease (VIE leases)
- private equity funds investment
- investment commitment
- stable value contracts
- venture capital investment funding obligations

**Credit facilities**

- master lease facilities
- credit facilities
- liquidity and credit facilities
- commitments to extend credit
- domestic credit facility
- secured credit facilities
- revolving credit facilities
- unused revolving credit facilities
- other revolving debt facilities
- other credit facilities

**Acquisition commitments**

- acquisition commitments
- contingent purchase obligations related to acquisition
- strategic alliance commitments

**Derivative instruments**

- venture commitments
- venture contributions
- venture fund commitments
- forward contracts
- credit-related financial instruments
- interest rate swaps
- foreign currency contracts
- terminated commodity hedges
- currency swap
- time charter commitments
- impairment on credit default swaps
- derivatives

**APPENDIX C**  
**Firm-specific off-balance sheet obligation items (continued)**

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**Asset securitization**

- notes securitized
- amortization of securitizations
- sale of accounts receivable
- receivable sale program
- mortgage commitments
- trade receivables securitization
- commitments to securitization structure
- asset pledges
- accounts receivable securitization program
- accounts receivable securitization facility
- securitization obligation

**Contingent liabilities**

- contingent royalty payments
  - contingent payment
  - contingent lease obligations
  - contingent rentals
  - contingent consideration
  - estimated gross loss payments under insurance and reinsurance
  - contingent interest
  - financial remarketing agreement
  - earn-out payments
  - contingent commitments for repurchase agreements
-

**APPENDIX D**  
**Types of covenant restrictions in private loan contracts**

Covenant Type	Number	Percentage
Max. Debt to EBITDA	216	21.22%
Min. Interest Coverage	201	19.74%
Max. Leverage ratio	136	13.36%
Min. Fixed Charge Coverage	122	11.98%
Net Worth	106	10.41%
Max. Capital Expenditure	82	8.06%
Tangible Net Worth	37	3.63%
Max. Senior Debt to EBITDA	35	3.44%
Min. EBITDA	27	2.65%
Max. Debt to Tangible Net Worth	25	2.46%
Min. Current Ratio	16	1.57%
Min. Debt Service Coverage	6	0.59%
Min. Cash Interest Coverage	3	0.29%
Max. Debt to Equity	2	0.20%

*Note:* This table shows the type, number and percentage of debt covenants in the 428 private loan packages.

## APPENDIX E

### Variable definitions

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#### Dependent variables

<i>Rating</i>	Rating for newly issued bonds is the first rating assigned within one month after the offering date of bonds issued within one year beginning at the fiscal-year end of the firm's first tabular disclosure of contractual obligations; Rating assigned to an existing bond is measured at one year after the fiscal-year end of the firm's first tabular disclosure of contractual obligations.
<i>Negative Watch</i>	An indicator variable equal to one if Moody's assigns a negative credit watch to an existing bond in one year beginning at the fiscal-year end of the firm's first tabular disclosure, and zero otherwise.
<i>Bond (Offering)-yield Spreads</i>	Bond yield to maturity minus yield on U.S. Treasury bond of comparable maturity (measured in basis points). <i>Bond (Offering)-yield Spreads</i> is measured at the bond's offering date for a newly issued bond, and are averaged by the par amounts of each transaction for an existing bond.
<i>Total Covenants</i>	The total number of financial and net worth covenants at the inception of a loan package.
<i>Financial Covenants</i>	The number of financial covenants at the inception of the loan package.
$\Delta \left( \frac{\text{Total Covenants}}{\text{Packages}} \right)$	An indicator variable equal to one if there is an increase in the number of <i>Total Covenants</i> over the number of loan packages following the firm's first tabular disclosure of contractual obligations.

#### Off-balance sheet obligations

<i>OBSO</i>	The present value of total off-balance sheet obligations, deflated by the firm value measured as the market value of common equity plus the book value of total on-balance-sheet liabilities and the present value of total off-balance-sheet obligations.
<i>Purchase Obligation</i>	The present value of purchase obligations, deflated by the firm value.
<i>Operating Lease</i>	The present value of operating leases, deflated by the firm value.
<i>Other OBSO</i>	The present value of off-balance sheet obligations other than purchase obligations and operating leases, deflated by the firm value.

#### Firm characteristics

<i>Leverage</i>	Total liabilities over firm value.
<i>Size</i>	The natural logarithm of fiscal year-end total assets.
<i>ROA</i>	Earnings before extraordinary items and discontinued operations, deflated by total assets.
<i>MB</i>	The market-to-book ratio, measured as the market value of common equity divided by the book value of common equity.
<i>CUMRET</i>	The cumulative daily stock returns over the fiscal year ending with the fiscal-year end of the firm's first tabular disclosure of contractual obligations.

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**APPENDIX E**  
**Variable definitions (continued)**

<i>Beta</i>	Market beta estimated from the market model using monthly stock returns in the five years up to the firm's first year of tabular disclosure.
<i>Earnings Volatility</i>	The standard deviation of quarterly income before extraordinary items divided by total assets for the past five years up to the first year of the firm's tabular disclosure.
<i>Capital Intensity</i>	Total property, plant, and equipment divided by total assets.
<i>Cash Flow</i>	Cash flows from operations deflated by total assets.
<i>Negative Equity</i>	An indicator variable that equals to one for firms with negative book value of common equity, and zero otherwise.
<b>Firm characteristics</b>	
<i>Firm Age</i>	The number of years for which total assets is reported in Compustat since 1970.
<i>Big 4</i>	An indicator variable that equals to one if the firm is audited by Big 4 auditors, and zero otherwise.
<i>ΔFirmsize</i>	The average change in total assets over the past five years.
<i>ΔLeverage</i>	The average change in <i>Leverage</i> over the past five years.
<b>Bond characteristics</b>	
<i>Maturity</i>	The natural logarithm of the number of years to maturity of the bond.
<i>Subordinate</i>	An indicator variable equal to 1 if the bond is subordinated, and zero otherwise.
<i>Put</i>	An indicator variable equal to 1 if the bond is puttable, and zero otherwise.
<i>Call</i>	An indicator variable equal to 1 if the bond is callable, and zero otherwise.
<i>Offer Size</i>	The natural logarithm of bond issue size (denominated in millions of dollars).
<i>ECYC</i>	The average yield on Moody's Aaa bonds less average yield on 30-year U.S. Treasury bonds for the issue month (trading year) of the corporate bond.
<i>Bond Age</i>	The natural logarithm of one plus the number of years between the bond's issue date and the fiscal-year end of the firm's first tabular disclosure (or the transaction dates).
<i>Amount Outstanding</i>	The natural logarithm of the par amounts outstanding for each bond at the fiscal-year end of the firm's first tabular disclosure (denominated in millions of dollars).
<b>Loan characteristics</b>	
<i>Deal Maturity</i>	The natural logarithm of a package's maturity in months, measured as the time period starting with the earliest loan start date and ending with the latest maturity date in the package.
<i>Deal Amount</i>	The natural logarithm of a package's offering amount.
<i>Number of Lenders</i>	The number of lenders for each loan package.

*Notes:* Off-balance sheet obligations and firm characteristics are all measured at the end of the fiscal year (Year 0) in which the firm made the first tabular disclosure. Newly issued bonds and private loan packages are issued within one year beginning at the fiscal-year end of Year 0.

**TABLE 1**  
**Sample selection procedures**

Sample	<i>N</i>
<b>Panel A: Summary of off-balance sheet obligations</b>	
S&P 1500 from the 2011 S&P Index Constituent	1,500
S&P 500 identified by using the Compustat S&P Index Constituent Identifier for fiscal year 2003, which are not maintained in the 2011 S&P 1500 Constituent	134
	<u>1,634</u>
(-) a firm filing 10-KSB rather than 10-K to shareholders, which are not required to follow Rule FR-67	(1)
(-) firms without 10-K filings in the SEC's EDGAR database, including one acquired and two registered in 2011	(3)
(-) firms never made tabular disclosures of contractual obligations in the MD&As	(2)
(-) a firm missing SEC's CIK – GVKEY match	(1)
(-) duplicated firm matches, including a firm's subsidiary and two firms which are former names of the other two in the sample	(3)
(-) firms missing total assets in Compustat for the first year of tabular disclosure	(7)
Number of observations used in Table 2	<u>1,617</u>
<b>Panel B: Public bonds</b>	
	New Bonds    Existing Bonds <sup>a</sup> Existing Bonds <sup>b</sup>
(-) firms missing CUSIP – FISD match	(640)    (853)    (615)
Number of firms	<u>977</u> <u>764</u> <u>1,002</u>
Number of bonds	<u>4,633</u> <u>30,312</u> <u>1,124</u>
(-) bonds with asset-backed, secured and credit-enhancement features	(71)    (550)    (123)
(-) floating rate bonds	(1,558)    (9,593)    (87)
(-) OTC and private bonds issued under Rule 144A	(124)    (689)    (0)
(-) convertible bonds	(54)    (322)    (39)
(-) bonds with missing yields, maturity dates, security levels, and callable (puttable) features	(1,428)    (10,781)    (438)
(-) bonds with missing debt rating and firm characteristics	(124)    (3,353)    (35)
Number of observations used in Tables 4 through 8 – <i>bond level</i>	<u>1,274</u> <u>5,024</u> <u>402</u>
– <i>firm level</i>	<u>105</u> <u>352</u> <u>151</u>
<b>Panel C: Private loans</b>	
(-) firms missing CUSIP – DealScan borrower ID match or with non-U.S. dollar facilities	(880)
Number of firms	<u>737</u>
Number of loan packages	<u>897</u>
(-) loan packages with missing covenant information	(389)
(-) loan packages with missing maturity	(1)
(-) loan packages with missing firm characteristics	(79)
Number of loan packages	<u>428</u>
(-) loan packages with missing debt ratings at Year -1	(130)
Number of observations used in Tables 9 and 10 – <i>loan-package level</i>	<u>298</u>
– <i>firm level</i>	<u>256</u>

*Notes:* The actual sample size varies depending on data availability for variables used in each regression.

<sup>a</sup> Existing bonds with Moody's ratings; <sup>b</sup> Existing bonds traded in the secondary OTC market.

**TABLE 2**  
**Summary statistics for major off-balance-sheet contractual obligation categories**

Off-balance-sheet Contractual Obligation Categories	N	Total Amount (in \$ Millions)	Summary Statistics (Deflated by total assets)			
			Mean	Q1	Median	Q3
Operating Lease	1,565	438,841.479	0.091	0.011	0.031	0.073
Purchase Obligation	805	647,508.121	0.141	0.010	0.034	0.096
Letters of Credit	284	181,617.108	0.019	0.004	0.009	0.022
Other Contractual Agreements and Commitments	162	1,033,222.473	0.075	0.006	0.019	0.076
Guarantees	162	32,975.526	0.020	0.003	0.009	0.021
Lines of Credit	97	593,122.078	0.090	0.026	0.064	0.115
Interest Obligations	86	34,632.325	0.090	0.016	0.055	0.118
Variable Interest Entities	77	66,125.036	0.026	0.003	0.010	0.024
Credit Facilities	51	82,274.120	0.103	0.025	0.069	0.155
Acquisition Commitments	42	4,052.351	0.035	0.004	0.013	0.032
Derivative Instruments	33	61,387.646	0.014	0.002	0.009	0.019
Asset Securitization	18	33,165.021	0.094	0.009	0.026	0.063
Contingent Liabilities	17	6,178.147	0.820	0.008	0.027	0.087

*Notes:* This table shows the frequency (*N*), total amount, and summary statistics of each off-balance-sheet obligation item for 1,617 sample companies. The statistics are all reported for firms that have tabular disclosures of each specific category. Off-balance-sheet obligations are measured for the firm's first year of tabular disclosure. Firm-specific terms for each category are shown in Appendix C.



**TABLE 3**  
**Descriptive statistics**

<b>Panel A: Full sample for S&amp;P 1500 companies</b>								
Variable	N	Mean	Min	Q1	Median	Q3	Max	Std. Dev.
<b>Off-balance sheet obligations:</b>								
<i>OBSO</i>	1,583	0.078	0.000	0.016	0.042	0.104	0.980	0.097
<i>Purchase Obligation</i>	1,583	0.024	0.000	0.000	0.000	0.016	0.726	0.062
<i>Operating Lease</i>	1,583	0.037	0.000	0.005	0.015	0.039	0.725	0.063
<i>Other OBSO</i>	1,583	0.017	0.000	0.000	0.000	0.010	0.599	0.048
<b>Firm characteristics:</b>								
<i>Leverage</i>	1,580	0.363	0.003	0.168	0.338	0.524	0.995	0.230
<i>Size</i>	1,617	7.458	3.778	6.166	7.319	8.658	12.456	1.826
<i>ROA</i>	1,617	0.035	-0.486	0.012	0.038	0.077	0.273	0.096
<i>MB</i>	1,584	3.066	-8.081	1.540	2.234	3.681	16.974	3.090
<i>CUMRET</i>	1,577	0.197	-0.743	-0.096	0.128	0.385	2.852	0.536
<i>Beta</i>	1,418	0.892	-0.339	0.333	0.704	1.170	3.932	0.809
<i>Earnings Volatility</i>	1,612	0.024	0.000	0.006	0.011	0.023	0.314	0.042
<i>Capital Intensity</i>	1,537	0.256	0.000	0.070	0.188	0.384	0.881	0.229
<i>Cash Flow</i>	1,530	0.102	-0.183	0.053	0.098	0.149	0.351	0.085
<i>Negative Equity</i>	1,617	0.022	0.000	0.000	0.000	0.000	1.000	0.146
<i>Firm Age</i>	1,615	18.307	1.000	8.000	16.000	32.000	37.000	11.505
<i>Big 4</i>	1,504	0.542	0.000	0.000	1.000	1.000	1.000	0.498
<i>ΔFirmsize</i>	1,607	0.343	-0.116	0.069	0.157	0.341	4.489	0.650
<i>ΔLeverage</i>	1,604	0.039	-0.413	-0.025	0.007	0.057	1.103	0.200
<b>Panel B: Moody's rating and bond characteristics for newly issued bonds</b>								
<i>Rating</i>	944	2.56	1	1	1	1	13	2.915
<i>Offering-yield Spreads (bps)</i>	1,274	99.394	-322.000	69.000	91.000	120.000	771.687	56.122
<i>Maturity</i>	1,274	1.729	0.005	1.120	1.620	2.306	3.689	0.790
<i>Subordinate</i>	1,274	0.001	0.000	0.000	0.000	0.000	1.000	0.028
<i>Put</i>	1,274	0.001	0.000	0.000	0.000	0.000	1.000	0.028
<i>Call</i>	1,274	0.997	0.000	1.000	1.000	1.000	1.000	0.056
<i>Offer Size</i>	1,274	3.986	-2.659	3.219	3.912	5.521	11.513	1.752
<i>ECYC (bps)</i>	1,274	114.113	43.111	88.714	100.500	162.905	192.050	42.586
<b>Panel C: Moody's rating and negative credit watch for existing bonds</b>								
<i>Rating<sub>+1</sub></i>	5,024	4.772	1	1	1	8	21	5.012
<i>Negative Watch<sub>+1</sub></i>	5,024	0.119	0	0	0	0	1	0.324
<b>Panel D: Bond characteristics for existing bonds traded in the secondary OTC market</b>								
<i>Bond-yield Spreads (bps)</i>	402	148.596	-54.615	64.875	91.132	143.770	1364.544	207.857
<i>Bond Age</i>	402	1.199	0.000	0.754	1.164	1.705	3.063	0.653
<i>Maturity</i>	402	2.253	0.038	1.723	2.198	2.759	4.559	0.779
<i>Subordinate</i>	402	0.017	0.000	0.000	0.000	0.000	1.000	0.131
<i>Put</i>	402	0.005	0.000	0.000	0.000	0.000	1.000	0.070
<i>Call</i>	402	0.980	0.000	1.000	1.000	1.000	1.000	0.140
<i>Amount Outstanding</i>	402	12.829	8.517	12.324	12.612	13.305	14.914	0.747
<i>ECYC (bps)</i>	402	67.635	47.319	51.275	61.430	72.845	134.706	19.932
<b>Panel E: Private loans</b>								
<i>Total Covenants</i>	298	2.211	1	1	2	3	7	1.116
<i>Financial Covenants</i>	298	1.916	0	1	2	2	6	1.046
<i>Δ(Total Covenants/Packages)</i>	160	0.138	0	0	0	0	1	0.345
<i>Deal Maturity</i>	298	3.348	0.693	2.485	3.584	4.094	4.522	0.775
<i>Deal Amount</i>	298	6.147	2.996	5.521	6.215	6.908	9.210	1.029
<i>Number of Lenders</i>	298	14.708	1	8	13	18	290	17.698

**TABLE 4**  
**Ordered probit regressions on Moody's ratings and off-balance sheet disclosures:**  
**Newly issued bonds**

Dependent variable *Rating* is the first Moody's bond rating assigned within one month after the bond's offering date. The public bonds are issued within one year beginning at the fiscal-year end of the firm's first tabular disclosure of contractual obligations. *OBSO* is measured as the present value of total off-balance sheet obligations. *Purchase Obligation* is measured as the present value of purchase obligations. *Operating Lease* is measured as the present value of operating leases. *Other OBSO* is measured as the present value of off-balance sheet obligations other than purchase obligations and operating leases. All on- and off-balance sheet obligations are deflated by the firm value at the fiscal year end. Off-balance sheet obligations and firm characteristics are all measured at the end of the fiscal year in which the firm made the first tabular disclosure. The constants are not tabulated. Statistical significance of the reported coefficients is based on clustered standard errors correcting for within-firm correlations. \*\*\*, \*\*, and \* represent significance at the 1%, 5%, and 10% level respectively, for a two-tailed test.

Independent variables	Predicted		Dependent variable: <i>Rating</i>					
	Sign		Coefficient (z-stat.)		Coefficient (z-stat.)		Coefficient (z-stat.)	
<u>Off-balance sheet obligations:</u>								
<b><i>OBSO</i></b>	$\beta_1$	+	<b>12.449</b>	<b>(4.42)***</b>	<b>13.893</b>	<b>(4.93)***</b>		
<i>Purchase Obligation</i>	$\beta_2$	+					<b>16.386</b>	<b>(4.65)***</b>
<i>Operating Lease</i>	$\beta_3$	+					4.682	(0.70)
<i>Other OBSO</i>	$\beta_4$	+					14.217	(3.22)***
<u>Firm characteristics at Year 0:</u>								
<i>Leverage</i>	$\beta_5$	+	5.416	(2.88)***	5.530	(2.98)***	6.229	(3.27)***
<i>Size</i>	$\beta_6$	-	-1.240	(-4.45)***	-1.267	(-4.42)***	-1.340	(-4.50)***
<i>ROA</i>	$\beta_7$	-	-15.948	(-2.18)**	-16.751	(-2.31)**	-16.237	(-2.08)**
<i>MB</i>	$\beta_8$	+	0.040	(0.45)	0.044	(0.54)	0.036	(0.45)
<i>CUMRET</i>	$\beta_9$	?	1.562	(1.76)	1.923	(2.11)**	1.905	(2.18)**
<i>Beta</i>	$\beta_{10}$	+	-0.829	(-1.61)	-1.027	(-1.90)*	-0.986	(-1.72)*
<i>Earnings Volatility</i>	$\beta_{11}$	+	35.167	(1.46)	39.151	(1.64)	43.071	(1.66)*
<i>Capital Intensity</i>	$\beta_{12}$	+	2.364	(1.10)	2.377	(1.10)	2.904	(1.34)
<i>Cash Flow</i>	$\beta_{13}$	-	-7.755	(-1.39)	-10.596	(-1.91)*	-10.413	(-1.90)*
<i>Negative Equity</i>	$\beta_{14}$	+	-3.264	(-2.04)**	-3.220	(-2.00)**	-3.557	(-2.01)**
<i>Firm Age</i>	$\beta_{15}$	-	-0.006	(-0.23)	-0.009	(-0.31)	-0.010	(-0.34)
<i>Big 4</i>	$\beta_{16}$	-	-0.161	(-0.35)	-0.195	(-0.42)	-0.214	(-0.46)
$\Delta$ <i>Firmsize</i>	$\beta_{17}$	+	-0.440	(-0.38)	-0.758	(-0.66)	-0.830	(-0.70)
$\Delta$ <i>Leverage</i>	$\beta_{18}$	+	2.097	(0.43)	2.050	(0.46)	1.546	(0.34)
<u>Bond issue characteristics:</u>								
<i>Maturity</i>	$\beta_{19}$	+			-0.450	(-2.26)**	-0.470	(-2.32)**
<i>Subordinate</i>	$\beta_{20}$	+			8.554	(6.85)***	8.394	(6.33)***
<i>Put</i>	$\beta_{21}$	-			2.082	(3.44)***	2.133	(3.27)***
<i>Call</i>	$\beta_{22}$	-			-0.017	(-0.02)	0.086	(0.11)
<i>Offer Size</i>	$\beta_{23}$	+			-0.055	(-0.73)	-0.047	(-0.61)
Industry Indicators			Included		Included		Included	
Number of Observations			944		944		944	
Pseudo R <sup>2</sup>			70.27%		71.52%		71.80%	

**TABLE 5**  
**Ordered probit regressions on Moody's ratings and off-balance sheet disclosures:**  
**Existing bonds**

Dependent variable  $Rating_{+1}$  is the Moody's rating assigned to a given bond at one year after the fiscal-year end of the firm's first tabular disclosure of contractual obligations.  $Debt\ Rating_{-1}$  is the S&P long-term debt rating assigned to the firm at one year before the fiscal-year end of the firm's first tabular disclosure of contractual obligations.  $Bond\ Age$  is the natural logarithm of one plus the number of years between the bond's issue date and the fiscal-year end of the firm's first tabular disclosure.  $Maturity$  is the natural logarithm of one plus the number of years to maturity of the bond.  $OBSO$  is measured as the present value of total off-balance sheet obligations.  $Purchase\ Obligation$  is measured as the present value of purchase obligations.  $Operating\ Lease$  is measured as the present value of operating leases.  $Other\ OBSO$  is measured as the present value of off-balance sheet obligations other than purchase obligations and operating leases. All on- and off-balance sheet obligations are deflated by the firm value at the fiscal year end. Off-balance sheet obligations and firm characteristics are all measured at the end of the fiscal year in which the firm made the first tabular disclosure. The constants are not tabulated. Statistical significance of the reported coefficients is based on clustered standard errors correcting for within-firm correlations. \*\*\*, \*\*, and \* represent significance at the 1%, 5%, and 10% level respectively, for a two-tailed test.

Independent variables	Predicted Sign	Dependent variable: $Rating_{+1}$					
		Coefficient (z-stat.)		Coefficient (z-stat.)		Coefficient (z-stat.)	
<u>Off-balance sheet obligations:</u>							
<b><i>OBSO</i></b>	$\beta_1$ +	<b>9.785</b>	<b>(5.92)***</b>				
<i>Purchase Obligation</i>	$\beta_2$ +			<b>10.040</b>	<b>(4.87)***</b>	1.599	(0.86)
<i>Operating Lease</i>	$\beta_3$ +			5.871	(2.40)**	0.106	(0.04)
<i>Other OBSO</i>	$\beta_4$ +			10.959	(5.02)***	7.351	(4.13)***
<u>Firm characteristics at Year 0:</u>							
<i>Leverage</i>	$\beta_5$ +	2.520	(3.16)***	2.596	(3.26)***	0.589	(0.94)
<i>Size</i>	$\beta_6$ -	-0.630	(-6.72)***	-0.658	(-6.70)***	-0.276	(-3.33)***
<i>ROA</i>	$\beta_7$ -	-6.522	(-3.42)***	-6.539	(-3.67)***	-5.020	(-2.01)**
<i>MB</i>	$\beta_8$ +	-0.047	(-1.68)*	-0.048	(-1.77)*	-0.046	(-1.70)*
<i>CUMRET</i>	$\beta_9$ ?	0.653	(2.90)***	0.587	(2.69)***	-0.416	(-1.95)*
<i>Beta</i>	$\beta_{10}$ +	0.076	(0.30)	0.079	(0.32)	0.133	(0.70)
<i>Earnings Volatility</i>	$\beta_{11}$ +	3.568	(0.47)	3.576	(0.51)	-2.378	(-0.39)
<i>Capital Intensity</i>	$\beta_{12}$ +	1.263	(1.50)	1.380	(1.71)*	-0.181	(-0.32)
<i>Cash Flow</i>	$\beta_{13}$ -	-3.933	(-2.05)**	-4.020	(-2.17)**	0.570	(0.39)
<i>Negative Equity</i>	$\beta_{14}$ +	-2.701	(-4.13)***	-2.638	(-4.02)***	-1.671	(-2.58)***
<i>Firm Age</i>	$\beta_{15}$ -	-0.013	(-1.11)	-0.010	(-0.89)	0.013	(1.55)
<i>Big 4</i>	$\beta_{16}$ -	-0.012	(-0.07)	-0.051	(-0.32)	0.073	(0.53)
$\Delta Firm\ size$	$\beta_{17}$ +	0.968	(2.53)**	0.995	(2.74)***	0.689	(2.03)**
$\Delta Leverage$	$\beta_{18}$ +	1.984	(2.45)**	1.796	(2.31)**	1.764	(2.23)**
<u>Firm-level debt rating at Year -1:</u>							
<b><i>Debt Rating<sub>-1</sub></i></b>	$\beta_{19}$ +/-					<b>0.723</b>	<b>(11.27)***</b>
<u>Bond characteristics:</u>							
<i>Bond Age</i>	$\beta_{20}$ +	-0.155	(-2.80)***	-0.156	(-2.78)***	-0.206	(-3.19)***
<i>Maturity</i>	$\beta_{21}$ +	-0.004	(-0.04)	-0.008	(-0.07)	0.069	(0.70)
<i>Subordinate</i>	$\beta_{22}$ +	1.518	(6.02)***	1.577	(6.80)***	1.164	(5.32)***
<i>Put</i>	$\beta_{23}$ -	0.113	(0.31)	0.102	(0.28)	0.144	(0.44)
<i>Call</i>	$\beta_{24}$ -	-0.368	(-2.32)**	-0.362	(-2.36)**	-0.388	(-2.31)**
<i>Amount Outstanding</i>	$\beta_{25}$ +	-0.011	(-0.30)	-0.003	(-0.10)	0.039	(1.16)
Industry Indicators		Included		Included		Included	
Number of Observations		5,024		5,024		5,024	
Pseudo R <sup>2</sup>		54.65%		54.76%		62.80%	

**TABLE 6**  
**Logistic regressions on Moody's negative credit watch and off-balance sheet disclosures:**  
**Existing bonds**

Dependent variable *Negative Watch<sub>+1</sub>* is an indicator variable equal to one if Moody's assigns a negative credit watch to the bond in one year beginning at the fiscal-year end of the firm's first tabular disclosure. *Debt Rating<sub>-1</sub>* is the S&P long-term debt rating assigned to the firm at one year before the fiscal-year end of the firm's first tabular disclosure. *Bond Age* is the natural logarithm of one plus the number of years between the bond's issue date and the fiscal-year end of the firm's first tabular disclosure. *Maturity* is the natural logarithm of one plus the number of years to maturity of the bond. *OBSO* is measured as the present value of total off-balance sheet obligations. *Purchase Obligation* is measured as the present value of purchase obligations. *Operating Lease* is measured as the present value of operating leases. *Other OBSO* is measured as the present value of off-balance sheet obligations other than purchase obligations and operating leases. All on- and off-balance sheet obligations are deflated by the firm value at the fiscal year end. Off-balance sheet obligations and firm characteristics are all measured at the end of the fiscal year in which the firm made the first tabular disclosure. Statistical significance of the reported coefficients is based on clustered standard errors correcting for within-firm correlations. \*\*\*, \*\*, and \* represent significance at the 1%, 5%, and 10% level respectively, for a two-tailed test.

Independent variables	Predicted		Dependent variable: <i>Negative Watch<sub>+1</sub></i>		
	Sign		Coefficient (z-stat.)	Coefficient (z-stat.)	Coefficient (z-stat.)
<i>Intercept</i>	$\beta_0$	?	-4.280 (-1.53)	-1.233 (-0.38)	-1.040 (-0.32)
<u>Off-balance sheet obligations:</u>					
<b><i>OBSO</i></b>	$\beta_1$	+	<b>8.085 (3.27)***</b>	<b>11.596 (3.49)***</b>	
<i>Purchase Obligation</i>	$\beta_2$	+			<b>13.889 (3.60)***</b>
<i>Operating Lease</i>	$\beta_3$	+			3.852 (0.60)
<i>Other OBSO</i>	$\beta_4$	+			11.531 (2.83)***
<u>Firm characteristics at Year 0:</u>					
<i>Leverage</i>	$\beta_5$	+	-2.529 (-1.22)	-1.040 (-0.47)	-0.129 (-0.06)
<i>Size</i>	$\beta_6$	-	0.087 (0.43)	-0.032 (-0.15)	-0.114 (-0.50)
<i>ROA</i>	$\beta_7$	-	-14.118 (-2.49)**	-18.038 (-2.92)***	-18.839 (-3.18)***
<i>MB</i>	$\beta_8$	+	-0.053 (-0.33)	-0.038 (-0.23)	-0.037 (-0.23)
<i>CUMRET</i>	$\beta_9$	?	-1.245 (-1.70)*	-0.744 (-1.02)	-0.712 (-0.95)
<i>Beta</i>	$\beta_{10}$	+	0.108 (0.18)	0.312 (0.48)	0.295 (0.47)
<i>Earnings Volatility</i>	$\beta_{11}$	+	-43.587 (-2.03)**	-46.898 (-1.97)**	-45.888 (-1.95)*
<i>Capital Intensity</i>	$\beta_{12}$	+	-0.834 (-0.59)	-0.179 (-0.13)	0.058 (0.04)
<i>Cash Flow</i>	$\beta_{13}$	-	0.281 (0.05)	-1.273 (-0.22)	-1.001 (-0.17)
<i>Negative Equity</i>	$\beta_{14}$	+	-4.957 (-3.71)***	-5.948 (-3.77)***	-6.402 (-4.17)***
<i>Firm Age</i>	$\beta_{15}$	-	0.016 (0.61)	0.004 (0.17)	0.003 (0.11)
<i>Big 4</i>	$\beta_{16}$	-	-0.381 (-0.99)	-0.347 (-0.90)	-0.424 (-1.11)
$\Delta$ Firmsize	$\beta_{17}$	+	1.366 (1.48)	1.508 (1.52)	1.717 (1.50)
$\Delta$ Leverage	$\beta_{18}$	+	-10.353 (-1.98)**	-11.994 (-2.18)**	-13.620 (-2.40)**
<u>Firm-level debt rating at Year -1:</u>					
<b><i>Debt Rating<sub>-1</sub></i></b>	$\beta_{19}$	+/-		<b>-0.231 (-2.34)**</b>	<b>-0.267 (-2.62)***</b>
<u>Bond characteristics:</u>					
<i>Bond Age</i>	$\beta_{20}$	+	-1.015 (-3.64)***	-1.063 (-3.59)***	-1.069 (-3.61)***
<i>Maturity</i>	$\beta_{21}$	+	1.040 (2.88)***	1.007 (2.73)***	1.021 (2.80)***
<i>Subordinate</i>	$\beta_{22}$	+	0.341 (0.53)	0.609 (0.89)	0.633 (0.93)
<i>Put</i>	$\beta_{23}$	-	-0.053 (-0.05)	-0.203 (-0.17)	-0.196 (-0.16)
<i>Call</i>	$\beta_{24}$	-	-0.963 (-1.16)	-0.999 (-1.14)	-0.911 (-1.07)
<i>Amount Outstanding</i>	$\beta_{25}$	+	0.133 (1.69)*	0.116 (1.46)	0.155 (1.74)*
Industry Indicators			Included	Included	Included
Number of Observations			5,024	5,024	5,024
Pseudo R <sup>2</sup>			55.01%	55.40%	55.57%

**TABLE 7**  
**Bond-yield spreads and off-balance sheet disclosures: Newly issued bonds**

Dependent variable *Offering-yield Spreads* is the bond's offering yield to maturity minus yield on U.S. Treasury bond of comparable maturity on the bond offering date (measured in basis points), measured for public bonds issued within one year beginning at the fiscal-year end of the firm's first tabular disclosure of contractual obligations. *OBSO* is measured as the present value of total off-balance sheet obligations. *Purchase Obligation* is measured as the present value of purchase obligations. *Operating Lease* is measured as the present value of operating leases. *Other OBSO* is measured as the present value of off-balance sheet obligations other than purchase obligations and operating leases. All on- and off-balance sheet obligations are deflated by the firm value at the fiscal year end. Off-balance sheet obligations and firm characteristics are all measured at the end of the fiscal year in which the firm made the first tabular disclosure. Statistical significance of the reported coefficients is based on clustered standard errors correcting for within-firm correlations. \*\*\*, \*\*, and \* represent significance at the 1%, 5%, and 10% level respectively, for a two-tailed test.

Independent variables	Predicted		Dependent variable: <i>Offering-yield Spreads</i>			
	Sign		Coefficient (t-stat.)		Coefficient (t-stat.)	
<i>Intercept</i>	$\beta_0$	?	87.823	(0.68)	78.803	(0.65)
<b>Off-balance sheet obligations:</b>						
<b><i>OBSO</i></b>	$\beta_1$	+	<b>519.508</b>	<b>(4.65)***</b>		
<b><i>Purchase Obligation</i></b>	$\beta_2$	+			<b>527.020</b>	<b>(5.19)**</b>
<i>Operating Lease</i>	$\beta_3$	+			955.889	(2.20)**
<i>Other OBSO</i>	$\beta_4$	+			208.663	(1.32)
<b>Firm characteristics at Year 0:</b>						
<i>Leverage</i>	$\beta_5$	+	265.141	(3.31)***	253.961	(3.53)***
<i>Size</i>	$\beta_6$	-	-33.408	(-4.50)***	-31.452	(-4.44)***
<i>ROA</i>	$\beta_7$	-	-636.859	(-2.64)***	-404.024	(-1.45)
<i>MB</i>	$\beta_8$	+	5.615	(2.04)**	4.385	(1.94)*
<i>CUMRET</i>	$\beta_9$	?	-93.906	(-2.19)**	-74.969	(-1.80)*
<i>Beta</i>	$\beta_{10}$	+	36.975	(1.92)*	38.874	(1.96)*
<i>Earnings Volatility</i>	$\beta_{11}$	+	208.323	(0.26)	-464.316	(-0.50)
<i>Capital Intensity</i>	$\beta_{12}$	+	-117.606	(-1.92)*	-133.699	(-2.17)**
<i>Cash Flow</i>	$\beta_{13}$	-	430.970	(2.12)**	299.628	(1.27)
<i>Negative Equity</i>	$\beta_{14}$	+	-25.595	(-0.58)	-62.008	(-1.29)
<i>Firm Age</i>	$\beta_{15}$	-	3.066	(2.58)**	2.687	(2.35)**
<i>Big 4</i>	$\beta_{16}$	-	-24.485	(-1.74)*	-25.737	(-1.83)*
<i>ΔFirmsize</i>	$\beta_{17}$	+	95.923	(2.73)***	99.833	(3.00)***
<i>ΔLeverage</i>	$\beta_{18}$	+	234.726	(1.43)	299.292	(1.74)*
<b>Bond Issue characteristics:</b>						
<i>Maturity</i>	$\beta_{19}$	+	28.037	(7.82)***	28.013	(7.92)***
<i>Subordinate</i>	$\beta_{20}$	+	181.636	(4.77)***	202.753	(4.86)***
<i>Put</i>	$\beta_{21}$	-	-97.524	(-5.66)***	-107.999	(-6.36)***
<i>Call</i>	$\beta_{22}$	-	-18.044	(-0.14)	0.779	(0.01)
<i>Offer Size</i>	$\beta_{23}$	+	-0.224	(-0.08)	-0.343	(-0.11)
<i>ECYC</i>	$\beta_{24}$	+	0.416	(27.70)***	0.418	(29.12)***
Industry Indicators			Included		Included	
Number of Observations			1,274		1,274	
Adjusted R <sup>2</sup>			53.06%		53.70%	

**TABLE 8**  
**Bond-yield spreads and off-balance sheet disclosures: Existing bonds**

Dependent variable *Bond-yield Spreads<sub>+1</sub>* is the bond yield spreads of public bonds trading in the secondary market for one year beginning at the fiscal-year end of the firm's first tabular disclosure of contractual obligations. For each bond trading transaction in the year, the bond yield spread is calculated as the bond yield-to-maturity (YTM) minus the interpolated YTM on U.S. Treasury bond of comparable maturity on the bond transaction date (measured in basis points). If there are multiple transactions of a given bond in the year, the bond yield spreads are averaged by the par amounts of each transaction. *Debt Rating<sub>-1</sub>* is the S&P long-term debt rating assigned to the firm at one year before the fiscal-year end of the firm's first tabular disclosure. *Bond Age* is natural logarithm of one plus the number of years between the issue date and the transaction date, weighted by the par amounts of each transaction. *Maturity* is the natural logarithm of one plus the number of years between the transaction date and the maturity date, weighted by the par amounts of each transaction. All the other variables are defined as before. Statistical significance of the reported coefficients is based on clustered standard errors correcting for within-firm correlations. \*\*\*, \*\*, and \* represent significance at the 1%, 5%, and 10% level respectively, for a two-tailed test.

Independent variables	Predicted		Dependent variable: <i>Bond-yield Spreads<sub>+1</sub></i>					
	Sign	?	Coefficient (t-stat.)		Coefficient (t-stat.)		Coefficient (t-stat.)	
<i>Intercept</i>	$\beta_0$	?	-136.859	(-0.53)	-602.431	(-1.71)*	-584.432	(-1.67)*
<b>Off-balance sheet obligations:</b>								
<b><i>OBSO</i></b>	$\beta_1$	+	<b>748.522</b>	<b>(3.86)***</b>	<b>448.976</b>	<b>(2.12)**</b>		
<i>Purchase Obligation</i>	$\beta_2$	+					<b>492.259</b>	<b>(2.16)**</b>
<i>Operating Lease</i>	$\beta_3$	+					47.216	(0.11)
<i>Other OBSO</i>	$\beta_4$	+					956.920	(1.49)
<b>Firm characteristics at Year 0:</b>								
<i>Leverage</i>	$\beta_5$	+	355.456	(2.88)***	224.158	(1.77)*	229.065	(1.86)*
<i>Size</i>	$\beta_6$	-	-24.332	(-1.82)*	2.041	(0.11)	2.980	(0.17)
<i>ROA</i>	$\beta_7$	-	-612.233	(-2.25)**	-530.064	(-1.91)*	-485.900	(-1.80)*
<i>MB</i>	$\beta_8$	+	15.539	(3.19)***	11.234	(2.40)**	10.049	(2.23)**
<i>CUMRET</i>	$\beta_9$	?	-78.820	(-2.03)**	-139.478	(-2.78)***	-146.615	(-2.90)***
<i>Beta</i>	$\beta_{10}$	+	83.898	(1.94)*	62.374	(1.72)*	70.387	(1.90)*
<i>Earnings Volatility</i>	$\beta_{11}$	+	572.098	(0.38)	0.417	(0.00)	252.068	(0.17)
<i>Capital Intensity</i>	$\beta_{12}$	+	164.537	(1.01)	114.766	(0.74)	102.429	(0.66)
<i>Cash Flow</i>	$\beta_{13}$	-	161.152	(0.56)	440.340	(1.68)*	500.344	(1.84)*
<i>Negative Equity</i>	$\beta_{14}$	+	237.084	(1.96)*	194.606	(1.83)*	147.173	(1.48)
<i>Firm Age</i>	$\beta_{15}$	-	0.161	(0.09)	1.717	(1.01)	1.576	(0.93)
<i>Big 4</i>	$\beta_{16}$	-	25.373	(1.05)	36.836	(1.49)	37.367	(1.51)
$\Delta$ Firmsize	$\beta_{17}$	+	231.883	(3.30)***	200.268	(3.43)***	189.583	(3.18)***
$\Delta$ Leverage	$\beta_{18}$	+	199.774	(0.81)	203.139	(0.79)	291.620	(1.08)
<b>Firm-level debt rating at Year -1:</b>								
<b><i>Debt Rating<sub>-1</sub></i></b>	$\beta_{19}$	+/-			<b>28.611</b>	<b>(2.64)***</b>	<b>28.518</b>	<b>(2.66)***</b>
<b>Bond characteristics:</b>								
<i>Bond Age</i>	$\beta_{20}$	+	16.653	(1.23)	14.581	(1.08)	12.589	(0.95)
<i>Maturity</i>	$\beta_{21}$	+	9.773	(1.04)	14.722	(1.73)*	13.807	(1.60)
<i>Subordinate</i>	$\beta_{22}$	+	157.580	(2.17)**	135.392	(1.90)*	123.290	(1.83)*
<i>Put</i>	$\beta_{23}$	-	-71.846	(-1.70)*	-84.329	(-2.01)***	-73.079	(-1.72)*
<i>Call</i>	$\beta_{24}$	-	-101.542	(-2.30)**	-88.679	(-1.74)*	-88.030	(-1.80)*
<i>Amount Outstanding</i>	$\beta_{25}$	+	-4.900	(-0.27)	-7.076	(-0.34)	-8.126	(-0.39)
<i>ECYC</i>	$\beta_{26}$	+	2.391	(3.53)***	2.543	(3.80)***	2.481	(3.60)***
Industry Indicators			Included		Included		Included	
Number of Observations			402		402		402	
Adjusted R <sup>2</sup>			61.09%		63.85%		64.04%	



**TABLE 9**  
**Ordered probit regressions on private loan covenants and off-balance sheet disclosures**

Dependent variable *Total Covenants*<sub>+1</sub> is the total number of debt covenants (i.e., financial and net worth covenants) for private loan packages issued within one year beginning at the fiscal-year end of the firm's first tabular disclosure of contractual obligations. Dependent variable *Financial Covenants*<sub>+1</sub> is the number of financial covenants. Packages with missing covenants in Dealscan are eliminated. *Debt Rating*<sub>-1</sub> is the S&P long-term debt rating assigned to the firm at one year before the fiscal-year end of the firm's first tabular disclosure. *Deal Maturity* is the natural logarithm of a package's maturity in months, measured as the time period starting with the earliest loan start date and ending with the latest maturity date in the package. *Deal Amount* is the natural logarithm of a package's offering amount. *Number of Lenders* is the number of lenders for each loan package. All the other variables are defined as before. The constants are not tabulated. Statistical significance of the reported coefficients is based on clustered standard errors correcting for within-firm correlations. \*\*\*, \*\*, and \* represent significance at the 1%, 5%, and 10% level respectively, for a two-tailed test.

Independent variables	Predicted Sign	Dependent variables			
		<i>Total Covenants</i> <sub>+1</sub>		<i>Financial Covenants</i> <sub>+1</sub>	
		Coefficient (z-stat.)	Coefficient (z-stat.)	Coefficient (z-stat.)	Coefficient (z-stat.)
<u>Off-balance sheet obligations:</u>					
<i>OBSO</i>	$\beta_1$ +	<b>3.089</b> (2.80)***			
<i>Purchase Obligation</i>	$\beta_2$ +		<b>2.602</b> (2.05)**	<b>3.088</b> (2.24)**	
<i>Operating Lease</i>	$\beta_3$ +		-0.677 (-0.29)	1.358 (0.51)	
<i>Other OBSO</i>	$\beta_4$ +		4.093 (2.18)**	4.159 (2.26)**	
<u>Firm characteristics at Year 0:</u>					
<i>Leverage</i>	$\beta_5$ +	3.348 (5.00)***	2.674 (3.72)***	3.527 (5.00)***	
<i>Size</i>	$\beta_6$ -	-0.266 (-2.21)**	-0.072 (-0.57)	-0.089 (-0.77)	
<i>ROA</i>	$\beta_7$ -	0.187 (0.09)	-0.031 (-0.01)	0.939 (0.49)	
<i>MB</i>	$\beta_8$ +	0.025 (1.14)	0.044 (1.92)*	0.070 (2.93)***	
<i>CUMRET</i>	$\beta_9$ ?	-0.184 (-0.98)	-0.474 (-2.23)**	-0.405 (-1.87)*	
<i>Beta</i>	$\beta_{10}$ +	0.067 (0.32)	0.057 (0.27)	0.044 (0.22)	
<i>Earnings Volatility</i>	$\beta_{11}$ +	-7.756 (-1.90)*	-12.065 (-2.64)***	-7.605 (-1.64)	
<i>Capital Intensity</i>	$\beta_{12}$ +	0.110 (0.21)	0.198 (0.38)	-0.504 (-0.93)	
<i>Cash Flow</i>	$\beta_{13}$ -	-1.052 (-0.69)	0.738 (0.44)	-0.441 (-0.27)	
<i>Negative Equity</i>	$\beta_{14}$ +	-0.440 (-0.76)	-0.723 (-1.26)	-0.321 (-0.56)	
<i>Firm Age</i>	$\beta_{15}$ -	0.002 (0.18)	0.015 (1.43)	0.015 (1.66)*	
<i>Big 4</i>	$\beta_{16}$ -	0.097 (0.56)	-0.003 (-0.02)	0.203 (1.22)	
$\Delta$ Firmsize	$\beta_{17}$ +	0.894 (2.76)***	0.710 (2.27)**	0.208 (0.72)	
$\Delta$ Leverage	$\beta_{18}$ +	0.369 (0.69)	-0.211 (-0.33)	-0.209 (-0.36)	
<u>Firm-level debt rating at Year -1:</u>					
<i>Debt Rating</i> <sub>-1</sub>	$\beta_{19}$ +/-		<b>0.282</b> (5.16)***	<b>0.292</b> (5.60)***	
<u>Package characteristics:</u>					
<i>Deal Maturity</i>	$\beta_{20}$ +	0.630 (4.95)***	0.559 (4.53)***	0.606 (5.14)***	
<i>Deal Amount</i>	$\beta_{21}$ +	-0.344 (-3.12)***	-0.420 (-3.70)***	-0.382 (-3.61)***	
<i>Number of Lenders</i>	$\beta_{22}$ +	0.006 (2.61)***	0.006 (2.48)**	0.006 (2.67)***	
Industry Indicators		Included	Included	Included	
Number of Observations		298	298	298	
Pseudo R <sup>2</sup>		23.77%	27.95%	31.93%	

**TABLE 10**

**Logistic regressions on private-loan covenant change and off-balance sheet disclosures**

Dependent variable  $\Delta\left(\frac{\text{Total Covenants}}{\text{Packages}}\right)_{+1}$  is an indicator variable equal to one if there is an increase in the number of debt covenants over the number of loan packages after the firm's first tabular disclosure of contractual obligations. All the other variables are defined as before. Statistical significance of the reported coefficients is based on clustered standard errors correcting for within-firm correlations. \*\*\*, \*\*, and \* represent significance at the 1%, 5%, and 10% level respectively, for a two-tailed test.

Independent variables		Predicted	Dependent variable			
			Sign	$\Delta\left(\frac{\text{Total Covenants}}{\text{Packages}}\right)_{+1}$		$\Delta\left(\frac{\text{Total Covenants}}{\text{Packages}}\right)_{+1}$
			Coefficient	(z-stat.)	Coefficient	(z-stat.)
<i>Intercept</i>	$\beta_0$	?	-8.348	(-1.62)	-7.705	(-1.34)
<b>Off-balance sheet obligations:</b>						
<b><i>OBSO</i></b>	$\beta_1$	+	<b>7.927</b>	<b>(2.34)**</b>		
<i>Purchase Obligation</i>	$\beta_2$	+			<b>9.907</b>	<b>(2.85)***</b>
<i>Operating Lease</i>	$\beta_3$	+			-2.548	(-0.31)
<i>Other OBSO</i>	$\beta_4$	+			11.267	(1.41)
<b>Firm characteristics:</b>						
<i>Leverage</i>	$\beta_5$	+	7.354	(2.20)**	7.120	(2.06)**
<i>Size</i>	$\beta_6$	-	-0.371	(-1.02)	-0.404	(-1.03)
<i>ROA</i>	$\beta_7$	-	-6.799	(-0.68)	-8.358	(-0.99)
<i>MB</i>	$\beta_8$	+	0.220	(1.68)*	0.205	(1.57)
<i>CUMRET</i>	$\beta_9$	?	-1.415	(-1.62)	-1.580	(-1.57)
<i>Beta</i>	$\beta_{10}$	+	0.433	(0.75)	0.368	(0.61)
<i>Earnings Volatility</i>	$\beta_{11}$	+	-24.154	(-0.74)	-26.915	(-0.77)
<i>Capital Intensity</i>	$\beta_{12}$	+	3.060	(1.18)	2.051	(0.83)
<i>Cash Flow</i>	$\beta_{13}$	-	-10.188	(-1.15)	-6.877	(-0.84)
<i>Firm Age</i>	$\beta_{14}$	-	0.078	(1.88)*	0.084	(1.80)*
<i>Big 4</i>	$\beta_{15}$	-	0.140	(0.16)	0.062	(0.07)
<i><math>\Delta</math>Firm size</i>	$\beta_{16}$	+	1.432	(2.33)**	1.436	(2.43)**
<i><math>\Delta</math>Leverage</i>	$\beta_{17}$	+	1.672	(0.70)	2.130	(0.81)
Industry Indicators			Included		Included	
Number of Observations			160		160	
Pseudo R <sup>2</sup>			48.33%		49.35%	



**TABLE 11**  
**Additional analyses: Ordered probit regressions on S&P long-term debt ratings and off-balance-sheet disclosures**

Dependent variable *S&P Debt Rating*<sub>+1</sub> is a numeric value corresponding to S&P long-term debt rating, ranging from 2 to 27 for AAA through D-rated debt. Year 0 denotes the fiscal year with the firm's first tabular disclosure of contractual obligations. *OBSO* is measured as the present value of total off-balance sheet obligations. *Purchase Obligation* is measured as the present value of purchase obligations. *Operating Lease* is measured as the present value of operating leases. *Other OBSO* is measured as the present value of off-balance sheet obligations other than purchase obligations and operating leases. All on- and off-balance sheet obligations are deflated by the firm value at the fiscal year end. Off-balance sheet obligations and firm characteristics are all measured at the end of the fiscal year in which the firm made the first tabular disclosure. The constants are not tabulated. Statistical significance of the reported coefficients is based on clustered standard errors correcting for within-firm correlations. \*\*\*, \*\*, and \* represent significance at the 1%, 5%, and 10% level respectively, for a two-tailed test.

Independent variables	Predicted Sign	Dependent variable: <i>S&amp;P Debt Rating</i> <sub>+1</sub>			
		Coefficient (z-stat.)		Coefficient (z-stat.)	
<b>Off-balance sheet obligations:</b>					
<i>OBSO</i>	$\beta_1$ +	<b>4.300</b>	<b>(7.06)***</b>	<b>3.037</b>	<b>(4.52)***</b>
<i>Purchase Obligation</i>	$\beta_2$ +			<b>1.770</b>	<b>(2.84)***</b>
<i>Operating Lease</i>	$\beta_3$ +			5.563	(4.04)***
<i>Other OBSO</i>	$\beta_4$ +			3.981	(2.25)**
<b>Firm characteristics at Year 0:</b>					
<i>Leverage</i>	$\beta_5$ +	3.657	(10.46)***	2.141	(5.39)***
<i>Size</i>	$\beta_6$ -	-0.521	(-10.99)***	-0.147	(-2.67)***
<i>ROA</i>	$\beta_7$ -	-3.526	(-4.44)***	-3.937	(-3.73)***
<i>MB</i>	$\beta_8$ +	0.006	(0.37)	0.024	(1.26)
<i>CUMRET</i>	$\beta_9$ ?	0.141	(1.50)	-0.485	(-5.19)***
<i>Beta</i>	$\beta_{10}$ +	0.443	(4.62)***	0.273	(3.16)***
<i>Earnings Volatility</i>	$\beta_{11}$ +	5.412	(1.82)*	-2.569	(-1.10)
<i>Capital Intensity</i>	$\beta_{12}$ +	0.288	(0.97)	0.345	(1.10)
<i>Cash Flow</i>	$\beta_{13}$ -	-1.790	(-2.15)**	-0.873	(-0.85)
<i>Negative Equity</i>	$\beta_{14}$ +	0.272	(0.60)	0.051	(0.10)
<i>Firm Age</i>	$\beta_{15}$ -	-0.025	(-4.81)***	0.000	(0.01)
<i>Big 4</i>	$\beta_{16}$ -	-0.022	(-0.25)	-0.074	(-0.77)
$\Delta$ Firmsize	$\beta_{17}$ +	0.183	(1.35)	-0.039	(-0.31)
$\Delta$ Leverage	$\beta_{18}$ +	0.592	(1.84)*	0.284	(0.85)
<b>Firm-level debt rating at Year -1:</b>					
<i>Debt Rating</i> <sub>-1</sub>	$\beta_{19}$ +/-			<b>0.751</b>	<b>(14.29)***</b>
Industry Indicators		Included		Included	Included
Number of Observations		639		639	639
Pseudo R <sup>2</sup>		21.80%		41.35%	41.66%

**TABLE 12**  
**Additional analyses: 2SLS regressions on credit risk and off-balance sheet obligations**

This table presents the 2SLS regression results for Tables 4 through 10, where off-balance sheet obligation (*OBSO*) is treated as endogenously determined. The first-stage regression results are tabulated for the first model (*Issue Rating*). Statistical significance of the reported coefficients is based on clustered standard errors correcting for within-firm correlations. \*\*\*, \*\*, and \* represent significance at the 1%, 5%, and 10% level respectively, for a two-tailed test.

	Dependent variables							
	<i>Issue Rating</i>				<i>Rating<sub>+1</sub></i>		<i>Negative Watch<sub>+1</sub></i>	
	First-stage		Second-stage		Second-stage		Second-stage	
	Coefficient	( <i>t</i> -stat.)	Coefficient	( <i>z</i> -stat.)	Coefficient	( <i>z</i> -stat.)	Coefficient	( <i>z</i> -stat.)
<i>Intercept</i>	-0.070	(-0.71)	15.749	(6.35)***	8.945	(3.20)***	0.034	(0.16)
<b><i>OBSO<sub>0</sub></i></b>			<b>18.743</b>	<b>(5.79)***</b>	<b>37.426</b>	<b>(10.48)***</b>	<b>0.923</b>	<b>(3.00)***</b>
<u>Instruments</u>								
<i>Leverage<sub>-1</sub></i>	-0.261	(-1.08)						
<i>Size<sub>-1</sub></i>	0.049	(0.69)						
<i>ROA<sub>-1</sub></i>	-1.541	(-4.09)***						
<i>MB<sub>-1</sub></i>	-0.004	(-1.26)						
<i>CUMRET<sub>-1</sub></i>	0.005	(0.18)						
<i>Beta<sub>-1</sub></i>	0.103	(2.41)**						
<i>Earnings Volatility<sub>-1</sub></i>	2.546	(3.11)***						
<i>Capital Intensity<sub>-1</sub></i>	0.424	(1.12)						
<i>Cash Flow<sub>-1</sub></i>	0.567	(2.99)***						
<i>Negative Equity<sub>-1</sub></i>	0.123	(1.38)						
<i>Big 4<sub>-1</sub></i>	0.148	(2.92)***						
<i>ΔFirmsize<sub>-1</sub></i>	-0.287	(-2.18)**						
<i>ΔLeverage<sub>-1</sub></i>	-0.793	(-2.79)***						
<i>Debt Rating<sub>-1</sub></i>	0.019	(4.77)***						
<u>Control variables</u>								
<i>Leverage<sub>0</sub></i>	-0.230	(-0.92)	6.573	(3.12)***	12.537	(6.76)***	-0.206	(-1.25)
<i>Size<sub>0</sub></i>	-0.027	(-0.35)	-1.149	(-4.83)***	-1.090	(-5.51)***	0.014	(0.99)
<i>ROA<sub>0</sub></i>	-0.673	(-1.88)*	-18.342	(-2.66)***	4.462	(1.00)	-0.770	(-2.03)**
<i>MB<sub>0</sub></i>	0.003	(0.78)	0.189	(2.62)***	0.151	(2.23)**	-0.006	(-0.95)
<i>CUMRET<sub>0</sub></i>	0.025	(0.40)	1.530	(1.56)	0.447	(0.79)	-0.073	(-1.59)
<i>Beta<sub>0</sub></i>	-0.061	(-1.20)	-1.146	(-1.60)	-0.174	(-0.25)	-0.013	(-0.34)
<i>Earnings Volatility<sub>0</sub></i>	0.077	(0.05)	39.755	(1.70)*	28.023	(2.17)**	-1.980	(-1.92)*
<i>Capital Intensity<sub>0</sub></i>	-0.340	(-0.89)	3.135	(1.57)	0.152	(0.10)	-0.159	(-1.19)

**TABLE 12**  
**Additional analyses: 2SLS regressions on credit risk and off-balance sheet obligations (continued)**

<i>Cash Flow</i> <sub>0</sub>	-0.178	(-0.69)	-9.523	(-1.68)*	4.015	(0.86)	-0.133	(-0.34)
<i>Negative Equity</i> <sub>0</sub>	0.054	(0.79)	0.333	(0.24)	2.056	(1.72)*	-0.365	(-3.46)***
<i>Firm Age</i> <sub>0</sub>	-0.001	(-0.92)	0.004	(0.15)	0.000	(0.01)	0.000	(-0.11)
<i>Big 4</i> <sub>0</sub>	-0.144	(-2.55)**	-0.179	(-0.38)	-0.065	(-0.21)	-0.008	(-0.26)
$\Delta$ <i>Firmsize</i> <sub>0</sub>	0.197	(1.36)	0.479	(0.39)	2.118	(2.84)***	0.057	(0.81)
$\Delta$ <i>Leverage</i> <sub>0</sub>	0.240	(0.58)	-3.648	(-0.68)	1.961	(0.57)	-0.253	(-1.06)
<i>Bond Age</i>					-0.158	(-1.53)	-0.052	(-1.90)*
<i>Maturity</i>	0.001	(0.87)	-0.065	(-1.01)	0.063	(0.59)	0.058	(1.71)*
<i>Subordinate</i>	-0.011	(-0.17)	5.558	(5.60)***	1.958	(3.98)***	0.015	(0.29)
<i>Put</i>	-0.019	(-0.97)	1.632	(3.29)***	0.083	(0.13)	-0.039	(-0.83)
<i>Call</i>	0.001	(0.43)	-0.023	(-0.21)	-0.419	(-1.37)	-0.031	(-0.50)
<i>Offer Size</i>	0.000	(-0.19)	-0.002	(-0.11)				
<i>Amount Outstanding</i>					0.080	(1.25)	0.013	(2.25)**
Industry Indicators	Included		Included		Included		Included	
Number of Observations	940		940		5,006		5,006	
Adj. R <sup>2</sup>	86.00%		96.82%		91.17%		43.15%	
Partial R <sup>2</sup> for the first stage	55.30%				35.76%		35.76%	
Over-identifying test (Sargan chi <sup>2</sup> )	550.51***				638.98***		57.76***	
Wu-Hausman F-test	186.18***				95.1096***		0.21	

**TABLE 12**  
**Additional analyses: 2SLS regressions on credit risk and off-balance sheet obligations (continued)**

Second-stage	Dependent variables			
	<i>Offering-yield Spreads</i>		<i>Bond-yield Spreads</i> <sub>+1</sub>	
	Coefficient	(z-stat.)	Coefficient	(z-stat.)
Intercept	-94.762	(-0.89)	-264.960	(-0.94)
<b><i>OBSO</i><sub>0</sub></b>	<b>436.505</b>	<b>(4.67)***</b>	<b>1683.560</b>	<b>(3.39)***</b>
<u>Control variables</u>				
<i>Leverage</i> <sub>0</sub>	192.241	(3.83)***	502.238	(3.80)***
<i>Size</i> <sub>0</sub>	-28.598	(-4.31)***	-14.505	(-1.06)
<i>ROA</i> <sub>0</sub>	-592.155	(-2.64)***	-539.144	(-2.06)**
<i>MB</i> <sub>0</sub>	5.145	(2.19)**	19.654	(3.33)***
<i>CUMRET</i> <sub>0</sub>	-83.404	(-2.02)**	-67.526	(-1.76)*
<i>Beta</i> <sub>0</sub>	25.262	(1.11)	75.234	(1.65)*
<i>Earnings Volatility</i> <sub>0</sub>	-531.142	(-0.71)	621.551	(0.48)
<i>Capital Intensity</i> <sub>0</sub>	-148.739	(-2.46)**	139.929	(0.92)
<i>Cash Flow</i> <sub>0</sub>	253.075	(0.99)	454.741	(1.47)
<i>Negative Equity</i> <sub>0</sub>	8.540	(0.14)	193.918	(1.76)*
<i>Firm Age</i> <sub>0</sub>	3.797	(3.17)***	-1.800	(-1.05)
<i>Big 4</i> <sub>0</sub>	-40.005	(-2.62)***	16.797	(0.71)
<i>ΔFirmsize</i> <sub>0</sub>	44.861	(0.87)	187.821	(2.80)***
<i>ΔLeverage</i> <sub>0</sub>	311.759	(1.97)**	73.187	(0.26)
<i>Bond Age</i>			21.789	(1.64)
<i>Maturity</i>	40.100	(8.74)***	8.152	(0.88)
<i>Subordinate</i>	215.200	(5.17)***	198.535	(2.03)**
<i>Put</i>	-106.792	(-6.32)***	-74.545	(-1.45)
<i>Call</i>	150.437	(1.69)*	-134.639	(-3.01)***
<i>Offer Size</i>	-3.333	(-2.25)**		
<i>Amount Outstanding</i>			-5.861	(-0.32)
<i>ECYC</i>	0.490	(27.24)***	2.343	(2.99)***
Industry Indicators	Included		Included	
Number of Observations	940		393	
Adj. R <sup>2</sup>	67.73%		56.91%	
Partial R <sup>2</sup> for the first stage	55.36%		28.31%	
Over-identifying test (Sargan chi <sup>2</sup> )	100.73***		43.07***	
Wu-Hausman F-test	0.72		4.74**	

**TABLE 12**  
**Additional analyses: 2SLS regressions on credit risk and off-balance sheet obligations (continued)**

Second-stage	Dependent variables			
	<i>Total Covenants</i> <sub>+1</sub>		$\Delta\left(\frac{\text{Total Covenants}}{\text{Packages}}\right)_{+1}$	
	Coefficient	(z-stat.)	Coefficient	(z-stat.)
Intercept	1.808	(2.22)**	-0.973	(-2.16)**
<b><i>OBSO</i><sub>0</sub></b>	<b>4.153</b>	<b>(2.78)***</b>	<b>2.070</b>	<b>(3.37)***</b>
<u>Control variables</u>				
<i>Leverage</i> <sub>0</sub>	2.958	(5.33)***	0.715	(1.86)*
<i>Size</i> <sub>0</sub>	-0.210	(-2.53)**	0.021	(0.56)
<i>ROA</i> <sub>0</sub>	0.948	(0.57)	1.534	(1.68)*
<i>MB</i> <sub>0</sub>	0.026	(1.42)	0.021	(1.57)
<i>CUMRET</i> <sub>0</sub>	-0.014	(-0.09)	-0.154	(-1.43)
<i>Beta</i> <sub>0</sub>	0.155	(0.89)	0.103	(1.30)
<i>Earnings Volatility</i> <sub>0</sub>	-5.350	(-1.72)*	0.166	(0.14)
<i>Capital Intensity</i> <sub>0</sub>	-0.165	(-0.43)	0.145	(0.54)
<i>Cash Flow</i> <sub>0</sub>	-0.621	(-0.54)	-0.383	(-0.55)
<i>Negative Equity</i> <sub>0</sub>	-0.372	(-0.84)	N/A	
<i>Firm Age</i> <sub>0</sub>	-0.004	(-0.47)	0.008	(2.42)**
<i>Big 4</i> <sub>0</sub>	-0.002	(-0.01)	-0.025	(-0.36)
$\Delta$ <i>Firm size</i> <sub>0</sub>	0.518	(2.05)**	0.058	(0.83)
$\Delta$ <i>Leverage</i> <sub>0</sub>	0.485	(1.13)	0.063	(0.23)
<i>Deal Maturity</i>	0.377	(4.59)***		
<i>Deal Amount</i>	-0.147	(-2.02)**		
<i>Number of Lenders</i>	0.004	(2.31)**		
Industry Indicators	Included		Included	
Number of Observations	290		130	
Adj. R <sup>2</sup>	33.57%		5.87%	
Partial R <sup>2</sup> for the first stage	20.51%		41.45%	
Over-identifying test (Sargan chi <sup>2</sup> )	32.70***		25.13**	
Wu-Hausman <i>F</i> -test	2.60		10.63***	

**TABLE 13**  
**Additional analyses: Credit risk and off-balance sheet obligations, controlling for off-balance sheet obligations at Year -1**

Credit risk is measured as the natural logarithm of bond-yield spreads and the Moody's ratings of public bonds trading in the secondary market. Years 0 and -1 are for the first tabular disclosure year and one year prior to the first tabular disclosure, respectively. This table reports regression results for public bonds trading in the secondary market in both Years 0 and -1. The independent variables are defined as those in Table 8. *OBSO* is measured as the present value of total off-balance sheet obligations, deflated by the firm value at the fiscal year end. The present value of operating leases for Year -1 is calculated using Compustat items #96, #164, #165, #166, #167, and #389. The present value of operating leases for Year 0 is calculated using data from the firm's first tabular disclosure. Purchase obligations and other off-balance sheet obligations are collected from firms' first tabular disclosures of contractual obligations for Year 0 and from footnote disclosures of commitments and contingencies for Year -1. Statistical significance of the reported coefficients is based on clustered standard errors correcting for within-firm correlations. \*\*\*, \*\*, and \* represent significance at the 1%, 5%, and 10% level respectively, for a two-tailed test.

Independent variables		Dependent variables			
		<i>Ln(Bond-yield Spreads)<sub>+1</sub></i>		<i>Rating<sub>+1</sub></i>	
		Coefficient	( <i>t</i> -stat.)	Coefficient	( <i>t</i> -stat.)
<i>Intercept</i>	?	5.468	(2.60)**	5.664	(2.91)***
<u>Off-balance sheet obligations:</u>					
<b><i>OBSO<sub>0</sub></i></b>	+	<b>1.975</b>	<b>(1.68)*</b>	<b>14.335</b>	<b>(2.79)***</b>
<i>OBSO<sub>-1</sub></i>	+/-			-15.004	(-2.38)**
<u>Firm characteristics at Year 0:</u>					
<i>Leverage</i>	+	1.574	(2.53)**	1.371	(2.51)**
<i>Size</i>	-	-0.014	(-0.14)	0.017	(0.20)
<i>ROA</i>	-	-0.28	(-0.12)	-0.248	(-0.12)
<i>MB</i>	+	0.014	(0.71)	0.079	(2.55)**
<i>CUMRET</i>	?	0.075	(0.43)	-0.065	(-0.40)
<i>Beta</i>	+	0.907	(3.21)***	0.713	(2.88)***
<i>Earnings Volatility</i>	+	12.086	(1.07)	28.227	(2.32)**
<i>Capital Intensity</i>	+	-0.562	(-1.01)	-1.263	(-1.98)*
<i>Cash Flow</i>	-	0.358	(0.31)	-0.278	(-0.25)
<i>Negative Equity</i>	+	-1.037	(-1.11)	-4.468	(-2.87)***
<i>Firm Age</i>	-	-0.01	(-1.34)	-0.015	(-2.10)**
<i>Big 4</i>	-	0.258	(1.28)	0.193	(1.10)
<i>ΔFirmsize</i>	+	-1.528	(-1.52)	-2.522	(-2.92)***
<i>ΔLeverage</i>	+	7.195	(2.59)**	6.857	(2.54)**
<u>Bond characteristics:</u>					
<i>Bond Age</i>	+	0.29	(2.20)**	0.261	(1.93)*
<i>Maturity</i>	+	0.237	(3.30)***	0.251	(3.65)***
<i>Subordinate</i>	+	1.189	(5.66)***	1.358	(5.12)***
<i>Put</i>	-	-0.877	(-3.96)***	-0.818	(-3.95)***
<i>Call</i>	-	-0.257	(-1.12)	-0.129	(-0.71)
<i>Amount Outstanding</i>	+	-0.267	(-1.94)*	-0.296	(-2.12)**
<i>ECYC</i>	+	0.025	(2.06)**	0.015	(1.24)
Industry Indicators		Included		Included	
Number of Observations		107		107	90
Adjusted R <sup>2</sup>		83.12%		83.86%	96.35%

**TABLE 14**  
**Additional analyses: Credit risk and off-balance sheet obligations, comparing the pre- and post-tabular disclosure periods**

Credit risk is measured as the natural logarithm of bond-yield spreads of public bonds trading in the secondary market. Years 0 and -1 are for the first tabular disclosure year and one year prior to the first tabular disclosure, respectively. This table reports regression results for public bonds trading in the secondary market in both Years 0 and -1. *POST* equals to 1 for event year 0 and 0 for Year -1. The present value of operating leases for Year -1 is calculated using Compustat items #96, #164, #165, #166, #167, and #389. The present value of operating leases for Year 0 is calculated using data from the firm's first tabular disclosure. Purchase obligations and other off-balance sheet obligations are collected from firms' first tabular disclosures of contractual obligations for Year 0 and from footnote disclosures of commitments and contingencies for Year -1. Statistical significance of the reported coefficients is based on clustered standard errors correcting for within-firm correlations. \*\*\*, \*\*, and \* represent significance at the 1%, 5%, and 10% level respectively, for a two-tailed test.

Independent variables	Predicted Sign	Dependent variable: $Ln(\text{Bond-yield Spreads})_{+1}$	
		Coefficient (t-stat.)	Coefficient (t-stat.)
<i>Intercept</i>	?	6.826 (2.63)**	7.008 (4.03)***
<u>Off-balance sheet obligations:</u>			
<i>Purchase Obligation</i>	+	-0.228 (-0.15)	-1.514 (-0.72)
<b><i>Purchase Obligation</i> × <i>POST</i></b>	+		<b>3.141 (2.08)**</b>
<i>Operating Lease</i>	+	22.035 (5.46)***	31.954 (6.00)***
<b><i>Operating Lease</i> × <i>POST</i></b>	+/-		<b>-14.512 (-2.83)***</b>
<i>Other OBSO</i>	+	2.854 (0.21)	-56.694 (-2.01)*
<b><i>Other OBSO</i> × <i>POST</i></b>	+		<b>38.976 (2.63)**</b>
<u>Firm characteristics:</u>			
<i>Leverage</i>	+	1.551 (2.00)*	3.249 (3.82)***
<i>Leverage</i> × <i>POST</i>	+/-		-2.808 (-2.93)***
<i>Size</i>	-	-0.018 (-0.14)	-0.381 (-3.73)***
<i>Size</i> × <i>POST</i>	+/-		0.534 (3.64)***
<i>POST</i>	+/-		-3.724 (-3.23)***
<u>Bond characteristics:</u>			
<i>Bond Age</i>	+	0.119 (0.84)	0.185 (1.44)
<i>Maturity</i>	+	0.328 (3.95)***	0.353 (4.37)***
<i>Subordinate</i>	+	2.294 (2.43)**	3.566 (3.96)***
<i>Call</i>	-	-0.274 (-0.22)	1.239 (1.00)
<i>Amount Outstanding</i>	+	-0.324 (-2.06)**	-0.213 (-1.70)*
<i>ECYC</i>	+	0.012 (3.79)***	0.021 (6.09)***
Industry Indicators		Included	Included
Number of Observations		89	89
Adjusted R <sup>2</sup>		78.13%	82.28%

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