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# Internal Control Disclosures, Monitoring, and the Cost of Debt

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**ABSTRACT:** We test the relationship between the change in a firm's cost of debt and the disclosure of a material weakness in an initial Section 404 report. We find that, on average, a firm's credit spread on its publicly traded debt marginally increases if it discloses a material weakness. We also examine the impact of monitoring by credit rating agencies and/or banks on this result and find that the result is more pronounced for firms that are not monitored. Additional analysis indicates that the effect of bank monitoring appears to be the primary driver of these monitoring results. This finding is consistent with the argument that banks are effective delegated monitors for the debt market. The results of this study suggest the need for future research, particularly to test the differential effects of monitoring on the cost of debt compared to the cost of equity.

**Keywords:** *cost of debt; monitoring of debt; bank monitoring; Section 404 reporting.*

**Data Availability:** *Data are publicly available from the sources identified in the text.*

## I. INTRODUCTION

Section 404 of the Sarbanes-Oxley Act of 2002 (hereafter, Sarbanes-Oxley) requires a publicly traded firm's Form 10-K to contain an audited report concerning the effectiveness of the firm's internal control over financial reporting. Under the Securities and Exchange Commission's (SEC) Final Rule on management's reporting on the effectiveness of internal control

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over financial reporting, and under Public Company Accounting Oversight Board (PCAOB) Auditing Standard No. 2 (AS 2), which were in effect during the time period examined in our study, firms are required to disclose in the Section 404 report any material weakness in internal control over financial reporting (SEC 2003; PCAOB 2004). By definition in AS 2, a material weakness indicates a more than remote likelihood that a material misstatement will not be prevented or detected in a firm's financial statements.<sup>1,2</sup> Section 404 became effective for fiscal years ending on or after November 15, 2004, for accelerated filers, defined as U.S. companies with an equity market capitalization exceeding \$75 million that file Form 10-K.

In this study, we use the release of an initial Section 404 report as a natural experiment to test whether the cost of a firm's publicly traded debt increases if it discloses a material weakness (hereafter, MW) in internal control over financial reporting. We have several reasons to expect that weak internal control over financial reporting is associated with a higher cost of debt. For example, weak internal control over financial reporting leads to a decrease in the precision of financial reporting numbers. This decrease in precision means that debt investors have less reliable information to assess default risk and to determine compliance with debt covenants (i.e., estimation risk increases), which leads investors to charge a higher cost of debt (Bhojraj and Sengupta 2003). Moreover, weak internal control over financial reporting suggests that managers find it easier to misappropriate a firm's cash flows (Lambert et al. 2007), thus increasing default risk, which again leads investors to charge a higher cost of debt. If weak internal control over financial reporting is associated with a higher cost of debt, then we predict that the disclosure of a MW in an initial Section 404 report is associated with an increase in the cost of a firm's publicly traded debt. We find marginal support for this prediction ( $p = 0.099$ ).

Even though we find that the disclosure of a MW is associated with an increase in a firm's cost of debt, it is possible that this finding may not hold equally between firms that are monitored and firms that are not monitored by credit rating agencies and/or banks. To our knowledge, prior research has not studied the impact of monitoring on the response of markets to the information in a Section 404 report. In Section II, we predict that the increased cost of debt associated with MW disclosure is more pronounced for firms that are not monitored than for firms that are monitored by credit rating agencies and/or banks. We find strong support for this prediction. Additional analysis indicates that the effect of bank monitoring appears to be the primary driver of these monitoring results. This finding is consistent with the argument that banks have a comparative advantage in carrying out information search and monitoring activities.

Ogneva et al. (2007) find that the effect of Section 404 requirements on a firm's cost of equity is strongest for delinquent filers. Also, Moody's Investors Service, Inc. (2005a) states that Moody's views a filing delay as indicating the most serious internal control over financial reporting problems. Consistent with these observations, we find that delinquent filers have an increase in their cost debt after the required initial Section 404 report filing date relative to firms that file a timely report.

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<sup>1</sup> More specifically, a material weakness is defined as a significant deficiency, or combination of significant deficiencies, that results in more than a remote likelihood that a material misstatement of the annual or interim financial statements will not be prevented or detected (PCAOB 2004). Firms are not required to disclose in a Section 404 report control deficiencies or significant deficiencies that do not rise to the level of a material weakness.

<sup>2</sup> Based on feedback received, including criticism that AS 2 was too costly and resulted in inefficient audits of internal controls, AS 2 was superseded by AS 5 (PCAOB 2007). AS 5 was effective for fiscal years ending on or after November 15, 2007, with early adoption permitted. Like AS 2, AS 5 continues to require disclosures of material weaknesses in internal control over financial reporting. However, the definition of material weakness in AS 5 is somewhat less inclusive than in AS 2. In particular, AS 5 uses the terminology "a reasonable possibility" rather than "a more than remote likelihood" that a material misstatement will not be prevented or detected. We have no reason to believe that our results would have been different under AS 5.

When we partition sample firms by their *ex ante* probability of reporting a MW in an initial Section 404 report, we find that low-probability firms have a larger increase in their cost of debt in response to reporting a MW than high-probability firms. This result is consistent with the notion that the debt market is more surprised when a firm with a low *ex ante* probability of reporting a MW actually reveals a MW than when this occurs for a high *ex ante* probability firm.

Concurrent studies by [Kim et al. \(2011\)](#) and [Costello and Wittenberg-Moerman \(2011\)](#) use bank loan credit spreads to examine some of the same issues that we investigate. The major difference between these two studies and our study is that [Kim et al. \(2011\)](#) and [Costello and Wittenberg-Moerman \(2011\)](#) focus on the impact of Sarbanes-Oxley reporting requirements in the private debt market, while we focus on this impact in the public debt market. As further discussed in Section VI, all three studies find that a firm's cost of debt increases after it discloses a MW. Thus, we view the three studies as complementary in that they collectively provide evidence that Sarbanes-Oxley reporting requirements can impact a firm's cost of debt in both the private debt market and the public debt market.

Our study contributes to the literature by examining the effect of Section 404 disclosures on the cost of debt rather than on the cost of equity.<sup>3</sup> One benefit to examining the cost of debt is that measures of the cost of debt are better defined and easier to estimate than measures of the cost of equity.<sup>4</sup> A more important benefit is that examining debt allows us to analyze the effect of monitoring, or a lack of monitoring, by two debt monitors (i.e., credit rating agencies and banks) on the relationship between the cost of debt and the disclosure of a MW. This analysis allows us to assess the impact that monitoring has on the response of markets to the information in a Section 404 report. This assessment of monitoring effects is valuable because, to our knowledge, prior research has not examined this issue. Further, the introduction of monitoring effects into the analysis creates some tension in the prediction that a firm's cost of debt increases if it discloses a MW. Finally, this analysis also provides evidence regarding (1) the argument that banks are effective delegated monitors for the debt market, and (2) the importance of bank monitoring relative to monitoring by credit rating agencies.

A third benefit to examining the cost of debt is that we are able to compare our results to the corresponding cost of equity results in [Ashbaugh-Skaife et al. \(2009\)](#). Based on this analysis, we are able to offer several suggestions for future research. These suggestions involve comparing and contrasting the effect of various monitoring agents on (1) the change in a firm's cost of equity and the disclosure of a MW, and (2) the change in a firm's cost of debt and the disclosure of a MW.

Section II develops the hypotheses. Section III provides a description of the sample. Section IV describes the primary test results. Section V compares these results to the cost of equity results in [Ashbaugh-Skaife et al. \(2009\)](#). Section VI reports the results of additional analyses. Section VII provides a summary of the major findings.

## II. HYPOTHESES

### Internal Control over Financial Reporting and the Cost of Debt

We have several reasons to expect that weak internal control over financial reporting is associated with a higher cost of debt. For example, cost of debt factors in the likelihood of default. At the same time, weak internal control over financial reporting leads to a reduction in the precision of financial reporting numbers, which decreases the reliability of the information needed to assess

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<sup>3</sup> Debt is an important source of financing for many firms. For example, among our sample firms, long-term debt as a percentage of equity is, on average, almost 60 percent.

<sup>4</sup> See [Botosan and Plumlee \(2005\)](#) for a discussion of the measurement of the cost of equity, as well as a comparison of different measures of the cost of equity.

the likelihood of default (i.e., estimation risk increases). This decrease in reliability would cause debt investors to charge a higher cost of debt to compensate for their decreased ability to accurately assess the likelihood of default (Bhojraj and Sengupta 2003). Similarly, since debt investors use financial reporting numbers to determine compliance with debt covenants (DeFond and Jiambalvo 1994), this decrease in reliability would lead debt investors to charge a higher cost of debt to compensate for their decreased ability to determine this compliance.

Lambert et al. (2007) observe, “[W]hen accounting quality increases, however, managers steal less, so more of the payoff goes to shareholders,” where payoff refers to a firm’s cash flows. This observation suggests that weak internal control over financial reporting, which decreases accounting quality, provides managers with more opportunities to misappropriate cash flows (i.e., misappropriation risk increases). This increased misappropriation risk increases default risk, thus increasing the cost of debt.

The disclosure of a MW in an initial Section 404 report indicates the potential for a material misstatement in a firm’s financial statements due to weak internal control over financial reporting. Thus, based on the preceding arguments, we predict that the disclosure of a MW in an initial Section 404 report is associated, on average, with an increase in a firm’s cost of debt. The hypothesis used to test this prediction is:

**H1:** Firms that initially disclose a MW under Section 404 experience a larger increase in their cost of debt compared to firms with no such disclosure.

### Monitoring Effects and the Cost of Debt

Although we predict that a firm’s cost of debt increases if it discloses a MW in an initial Section 404 report, it is possible that this average prediction does not hold equally for firms that are monitored compared to firms that are not monitored by credit rating agencies and/or banks. When monitoring debt, a credit rating agency assesses the quality of a firm’s internal control over financial reporting. This assessment is reflected in the credit rating assigned to the firm. Consistent with this notion, Moody’s Investors Service, Inc. (2005b) indicates that, for firms that report a Section 404 MW, rating actions are not needed in most cases, as the Moody’s rating already reflects Moody’s impression of the control weaknesses that are eventually disclosed in a Section 404 report.

Based on the preceding, we expect that a firm’s credit rating provides the debt market with indirect information about the quality of a firm’s internal control over financial reporting, thereby reducing the importance of the information provided to the debt market in a Section 404 report. This reduced importance should lead to a smaller increase in a firm’s cost of debt upon the disclosure of a MW than the increase that would occur if no monitoring by credit rating agencies existed. If the preceding is the case, then we expect:

**H2a:** The increased cost of debt associated with MW disclosure is more pronounced for firms with unrated debt than for firms with rated debt.

Diamond (1984) and Fama (1985), among others, argue that banks serve as effective monitors for the debt market because they have a comparative advantage in carrying out information search and monitoring activities. For example, bankers have an ongoing relationship with a borrower, allowing them access to information about a borrower that is not publicly available (Fama 1985). Also, bankers find it easier to monitor a firm because other providers of corporate debt are more dispersed; thus, monitoring by these other providers suffers from free-rider problems (Diamond 1984). Many empirical studies document support for the notion that banks serve as effective delegated monitors (e.g., James 1987; Datta et al. 2000; Bharath et al. 2008; Altman et al. 2010).

Given the preceding, we argue that firms without bank loans exhibit a larger increase in their cost of debt following the disclosure of a MW in an initial Section 404 report than firms with bank

loans. If a bank makes a loan to a given firm, the bank would assess the quality of the firm's internal control over financial reporting; this assessment would be reflected in the interest rate on the loan. In other words, banks would price protect against internal control over financial reporting problems. Further, a firm that has bank loans must disclose information about the terms of these loans in Form 10-K. Also, there are databases that provide detailed information about the terms of a firm's bank loan agreements (e.g., DealScan). This information would provide the debt market with indirect information about the quality of a firm's internal control over financial reporting, thereby reducing the importance of the information provided in a Section 404 report.

Further, the debt market could use this information to mimic the behavior of banks and also price protect against internal control over financial reporting problems, thereby reducing (relative to firms not subject to bank monitoring) the reaction of the cost of debt to the disclosure of a MW.<sup>5</sup> Based on the preceding arguments, we expect:

**H2b:** The increased cost of debt associated with MW disclosure is more pronounced for firms that are not subject to bank monitoring than for firms that are subject to bank monitoring.

We initially test H2a and H2b separately. We then test these hypotheses jointly to determine if the monitoring effect of credit rating agencies and that of banks each has its own incremental effect on the relationship between the cost of debt and the disclosure of a MW, as opposed to one effect subsuming the other.

### Delinquent Filers and the Cost of Debt

Ogneva et al. (2007) find that the effect of Section 404 on the cost of equity is strongest for delinquent filers. Additionally, Moody's Investors Service, Inc. (2005a, 1–2) views a delay in filing a Section 404 report as indicating the most serious internal control over financial reporting problems for the following reasons:

- Late filers may heighten uncertainty about the nature and extent of their control deficiencies while the company and its auditor complete their evaluation of the company's controls. This uncertainty, in turn, raises questions about the reliability of the company's financial data, particularly un-audited data, the ultimate timing of filing reports with the SEC, and the nature of the company's plan to remediate control problems.

Regarding liquidity, later filers may:

- *Temporarily lose access to the public capital markets* because their SEC filings are "delinquent";
- *Also miss the deadline for filing audited financial statements*, which, in turn, could cause uncertainty among market participants and affect the amount and terms of capital available to the company; and
- *Violate covenants in credit agreements and/or indentures*. A common covenant requires timely filing of financial data with the SEC.

Based on the preceding, we test the following hypothesis:

**H3:** Firms that delay filing an initial Section 404 report experience an increase in their cost of debt relative to timely filers.

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<sup>5</sup> If the debt market did not behave in this manner, then it is possible that the cost of debt would significantly increase when a firm that a bank is supposed to be monitoring discloses a MW in an initial Section 404 report. However, our results suggest that this is not the case.

## The *Ex Ante* Probability of Reporting a MW and the Cost of Debt

Ashbaugh-Skaife et al. (2009) document that the increase in the cost of equity for firms with a low *ex ante* probability of reporting a MW is greater than the increase for high-probability firms when a Section 302 material weakness (hereafter, Section 302 MW) or a Section 404 MW is disclosed.<sup>6</sup> This finding is consistent with the notion that the equity market is more surprised when a firm with a low *ex ante* probability of reporting a MW actually reveals a MW than when this occurs for a high *ex ante* probability firm. Based on this evidence, we expect:

- H4:** The increased cost of debt associated with MW disclosure is more pronounced for low *ex ante* probability of reporting MW firms than for high *ex ante* probability firms.

### III. SAMPLE SELECTION AND DESCRIPTIVE STATISTICS

The initial sample of Section 404 disclosures consists of 4,536 firm-years identified as reporting or not reporting a Section 404 MW in their Form 10-K filings between November 3, 2004, and March 3, 2006, according to the Audit Analytics Internal Controls (hereafter, Audit Analytics) database. We eliminate firm-years with erroneous or duplicate CIK codes (these are the firm-identifier codes that Audit Analytics uses), duplicate or triplicate firm-years (e.g., where a firm disclosed internal control status updates in a subsequent year's Form 10-K), and firm-years not in the Compustat database. After applying these screens, we are left with 3,640 (3,087 non-MW and 553 MW) unique firms making an initial Section 404 disclosure. The firms come from a broad range of industries. For example, only four two-digit SIC industries comprise more than 5 percent of the firms, with the greatest concentration in SIC 60 (Depository Institutions, 10.93 percent of firms) and SIC 73 (Business Services, 10.27 percent of firms).

To obtain yield data, we use the National Association of Securities Dealers (NASD) Trade Reporting and Compliance Engine (TRACE) fixed income securities transaction data. All brokers/dealers who are NASD members have an obligation to report transactions in corporate debt instruments via the TRACE system. TRACE should provide a relatively complete picture of trading in corporate debt instruments. For example, by the time of our sample period, (1) "As a general rule, the vast majority of dollar denominated corporate debt instruments must be reported to TRACE" (NASD 2004, 4), and (2) "approximately 99% of all transactions and 95% of par value in the TRACE-eligible securities market are disseminated immediately" (SEC 2005, 5).<sup>7</sup> Further, the data collected and disseminated on these transactions would cover the majority of all transactions in corporate bonds because "[m]ost corporate bonds trade in the over-the-counter (OTC) market . . . The OTC market is much larger than the exchange markets, and the vast majority of bond transactions, even those involving exchange-listed issues, take place in this market" (Securities Industry and Financial Markets Association [SIFMA] 2009, 1).

<sup>6</sup> Ashbaugh-Skaife et al. (2009) use both Section 302 and Section 404 disclosures in their analysis. Section 302, which was finalized and implemented on August 29, 2002, requires management to certify in quarterly and annual reports that disclosure control processes and procedures have been designed and implemented, and to conclude on the effectiveness of disclosure controls. Both Sections 302 and 404 require the disclosure of material weaknesses in internal control over financial reporting. Under Section 302, the disclosure is the responsibility of management, while under Section 404, the disclosure is the responsibility of the firm's independent auditor, as well as management.

<sup>7</sup> For example, in 2004 TRACE was collecting data on secondary over-the-counter market transactions for approximately 23,000 publicly traded corporate bond issues, including investment-grade debt, high-yield debt, and unrated debt, and on a typical day \$20 billion par value of corporate bonds turned over in approximately 25,000 transactions (NASD 2004). In 2005, transactions not reported immediately were subject to a maximum ten-business-day reporting delay, except for trades of Rule 144A securities, which were not disseminated because of the limited transferability and tradability of securities sold pursuant to Rule 144A (SEC 2005).

TRACE provides transaction-specific information, including price and yield. Using this data, we calculate the transaction-specific credit spread as yield to maturity, or YTM, on a given corporate debt instrument transaction minus YTM (obtained from Federal Reserve Board [2006]) on a Treasury security matched on time to maturity.<sup>8</sup>

We remove from the sample firms with missing required data, and four firms for which the absolute value of the test variable  $\Delta DefaultRisk$  exceeds 400 percent.<sup>9</sup> We also remove 43 firms that report a Section 302 MW prior to their initial Section 404 report.<sup>10,11</sup> These procedures yield a sample of 577 (531 non-MW and 46 MW) firms. Table 1 reports descriptive statistics for these firms.

Similar to previous studies, MW firms are smaller, less profitable, and more distressed than non-MW firms.<sup>12</sup> Also, for both MW and non-MW firms, there is an increase in credit spreads in the time period following the initial Section 404 report filing date, indicating that our tests should control for this general increase in credit spreads over the test period. Moreover, MW firms have a higher pre-report credit spread than non-MW firms, suggesting that the debt market, at least partially, can anticipate which firms are more likely to disclose a MW. This last observation indicates that our tests should control for pre-report credit spreads.

Finally, if we partition the *Spread (pre)* data in Table 1 by bank monitoring status, we find that, for bank-monitored firms over days  $[-45, -3]$  relative to the initial Section 404 report filing date, the mean spread for MW firms in excess of the mean spread for non-MW firms equals 3.22 percent. For firms not subject to bank monitoring, the corresponding difference is 1.69 percent. Finally, consistent with the notion that banks serve as effective monitors and that the debt market mimics bank behavior, the difference between 3.22 percent and 1.69 percent is marginally significant ( $p = 0.062$ ).

#### IV. TEST DESIGN AND RESULTS

##### Test of H1: Internal Control Disclosures and the Cost of Debt

###### Test Design

To examine if firms that initially disclose a Section 404 MW experience an increase in their cost of debt relative to firms with no such disclosure, we estimate Model (1):<sup>13</sup>

<sup>8</sup> In these calculations, to eliminate outliers, we delete the top and bottom 1 percent of transaction-specific yield observations.

<sup>9</sup> Our conclusions do not change if we estimate our models after setting  $\Delta DefaultRisk$  for these four firms equal to the next most extreme value of  $\Delta DefaultRisk$  observed in the distribution of  $\Delta DefaultRisk$ .

<sup>10</sup> These firms are removed because (1) the disclosure of a prior Section 302 MW may preempt any information provided by the disclosure of a MW in an initial Section 404 report, and (2) we do not want firms that disclose a prior Section 302 MW, but disclose no MW in an initial Section 404 report, included in the sample because the remediation of a material weakness is not the primary interest of our study.

<sup>11</sup> Approximately 85 percent of our sample firms have complete data on debt seniority. We do not want to reduce the sample size for our regression tests further by requiring data on debt seniority. If we estimate our models after adding the variable *Seniority*, coded 1 for firms that have trades in only senior/senior secured debt instruments, and 0 for firms that either have trades in at least some less senior debt instruments or have missing seniority data, the estimated coefficient on *Seniority* is negative and not significant at conventional levels (most significant  $p = 0.115$ ). The only notable change in our results is that the estimated coefficient on *MW* in Model (1) is positive at  $p = 0.120$  (rather than  $p = 0.099$ ). Based on this analysis, we conclude that the seniority of debt does not appear to have an influence on our test results.

<sup>12</sup> The previous studies that we refer to here are Ge and McVay (2005), Ashbaugh-Skaife et al. (2007, 2009), Doyle et al. (2007), Ogneva et al. (2007), Beneish et al. (2008), Hogan and Wilkins (2008), Crabtree et al. (2009), Elbannan (2009), and Kim et al. (2011).

<sup>13</sup> Appendix A summarizes the data sources used to calculate model variables.



**TABLE 1**  
**Descriptive Statistics**

Variable	531 Non-MW Firms			46 MW Firms		
	Mean	Median	Std. Dev.	Mean	Median	Std. Dev.
<i>Yield (pre)</i>	4.982	4.822	2.230	7.788*	6.042*	6.784
<i>Yield (post)</i>	5.520	5.260	2.641	8.539*	6.529*	6.844
<i>Spread (pre)</i>	1.308	1.011	2.240	4.050*	2.487*	6.750
<i>Spread (post)</i>	1.676	1.311	2.693	4.737*	2.634*	6.811
<i>DefaultRisk (pre)</i>	-1.800	-1.841	2.039	-0.578*	-0.691*	2.045
<i>DefaultRisk (post)</i>	-1.431	-1.652	1.685	-0.415*	-0.248*	2.010
<i>Assets (pre)</i>	7760.93	2878.48	14151.94	4427.13*	1317.92*	7560.75
<i>Assets (post)</i>	7915.96	2978.40	14411.51	4332.26*	1298.93*	7353.87
<i>CFO (pre)</i>	0.054	0.060	0.078	0.016*	0.016*	0.055
<i>CFO (post)</i>	0.086	0.092	0.101	0.037*	0.041*	0.082
<i>Leverage (pre)</i>	0.319	0.271	0.203	0.299	0.290	0.169
<i>Leverage (post)</i>	0.315	0.266	0.208	0.310	0.284	0.171
<i>CFVol (pre)</i>	0.043	0.036	0.031	0.045	0.033	0.037
<i>CFVol (post)</i>	0.045	0.038	0.032	0.044	0.036	0.036
<i>TrsYTM (pre)</i>	3.674	3.754	0.640	3.738	3.900	0.712
<i>TrsYTM (post)</i>	3.844	3.933	0.604	3.802	3.917	0.645
<i>Restructure (pre)</i>	0.311	0	0.463	0.478*	0	0.505
<i>Restructure (post)</i>	0.382	0	0.486	0.478	0	0.505
<i>WriteDown (pre)</i>	0.130	0	0.337	0.152	0	0.363
<i>WriteDown (post)</i>	0.196	0	0.397	0.304	0	0.465
<i>M&amp;A (pre)</i>	0.043	0	0.204	0.022	0	0.147
<i>M&amp;A (post)</i>	0.055	0	0.227	0.022	0	0.147
<i>Restate (pre)</i>	0.122	0	0.327	0.111	0	0.318
<i>Restate (post)</i>	0.127	0	0.334	0.178	0	0.387

\* Indicates that the "531 Non-MW Firms" value is significantly different from the "46 MW Firms" value at the two-tailed 5 percent level or better, based on a t-test of difference in means or a Wilcoxon two-sample test for medians. Table 1 provides summary statistics for the 531 sample firms that do not report a MW and the 46 sample firms that do report a MW in an initial Section 404 report.

Variable Definitions:

*Yield (pre)* = mean (for all TRACE-reported trades in a firm's debt issues) YTM over days [-45, -3] relative to the initial Section 404 report filing date;

*Yield (post)* = mean (for all TRACE-reported trades in a firm's debt issues) YTM over days [+3, +45];

*Spread (pre)* = mean (for all TRACE-reported trades in a firm's debt issues) credit spread over days [-45, -3], where the credit spread for each trade is YTM on the relevant debt issue minus YTM on a matched-by-maturity Treasury security;

*Spread (post)* = mean (for all TRACE-reported trades in a firm's debt issues) credit spread over days [+3, +45];

*DefaultRisk* = score from the bankruptcy model of Ohlson (1980);

*Assets* = total assets in \$ millions;

*CFO* = cash flow from operations scaled by total assets;

*Leverage* = long-term debt scaled by total assets;

*CFVol* = standard deviation over the last 20 quarters of cash flow from operations scaled by total assets;

For each sample firm  $i$ ,  $TrsYTM_i (pre)$  = the mean of all "YTM on a matched-by-maturity Treasury security" used to calculate  $Spread_i$  over days [-45, -3], and  $TrsYTM_i (post)$  = the mean of all "YTM on a matched-by-maturity Treasury security" used to calculate  $Spread_i$  over days [+3, +45]; and

*Restructure (WriteDown, M&A, Restate)* = an indicator variable equal to 1 if restructuring (writedown, M&A, restatement) activity occurs in a given period, and 0 otherwise.

(continued on next page)

TABLE 1 (continued)

For *DefaultRisk*, *Assets*, *CFO*, and *Leverage*, (*pre*) refers to value for Q3 and (*post*) refers to value for Q4, where Q4 is the fourth quarter of the fiscal year that is reported on in a firm's initial Section 404 report and Q3 is the preceding quarter. For *CFVol*, (*pre*) refers to the last 20 quarters ending in Q3, and (*post*) refers to the last 20 quarters ending in Q4. For *Restructure*, *WriteDown*, and *M&A*, (*pre*) refers to restructuring, writedown, and M&A activity, respectively, during Q3, and (*post*) refers to this activity during Q4. For *Restate*, due to data constraints, (*pre*) refers to restatement activity during FY-1, and (*post*) refers to this activity during FY, where FY is the fiscal year that is reported on in a firm's initial Section 404 report.

The sample of firms filing an initial Section 404 report consists of firms that (1) provide a Section 404 report in their Form 10-K filings made between November 3, 2004, and March 3, 2006, according to the Audit Analytics Internal Controls database, after eliminating firm-years with erroneous or duplicate CIK codes (these are the firm-identifier codes that Audit Analytics uses) and duplicate or triplicate firm-years (e.g., where a firm disclosed internal control status updates in a subsequent year's Form 10-K), and (2) have all the data needed to estimate our regression models. We remove from the sample 43 firms that report a Section 302 material weakness prior to their initial Section 404 report and four firms for which the absolute value of the test variable  $\Delta DefaultRisk$  (see Table 2) exceeds 400 percent.

$$\begin{aligned} \Delta Spread = & \alpha_0 + \beta_0 MW + \beta_1 \Delta DefaultRisk + \beta_2 \Delta Size + \beta_3 \Delta CFO \\ & + \beta_4 \Delta Leverage + \beta_5 \Delta CFVol + \beta_6 \Delta TrsYTM + \beta_7 \Delta Restructure \\ & + \beta_8 \Delta WriteDown + \beta_9 \Delta M\&A + \beta_{10} \Delta Restate + \varepsilon. \end{aligned} \quad (1)$$

Model (1) employs a difference-in-differences test design that compares each MW and non-MW firm to itself by measuring the change in a firm's credit spread around an initial Section 404 report ( $\Delta Spread$ ) as the credit spread following the report minus the credit spread preceding the report. To calculate  $\Delta Spread$ , we first identify all TRACE trades in a firm's debt instruments that occur over days  $[-45, -3]$  and days  $[+3, +45]$  relative to the initial Section 404 report filing date. For each trade, we measure the credit spread as YTM on the relevant debt issue minus YTM on a matched-by-maturity Treasury security. We then calculate  $\Delta Spread$  for each firm as the mean (for all firm-specific trades) credit spread over days  $[+3, +45]$  minus the mean credit spread over days  $[-45, -3]$ .<sup>14</sup>

By measuring  $\Delta Spread$  as the credit spread following minus the credit spread preceding an initial Section 404 report, we attempt to control for observable firm characteristics that could be used to predict a MW, and thus impact the response of the credit spread to the information in an initial Section 404 report. In particular,  $\Delta Spread$  takes into account the credit spread before a firm files an initial Section 404 report, which includes the effect of these firm characteristics with regards to the debt market's anticipation of how likely it is that a firm will report a MW.

The test design also uses the indicator variable *MW*, set equal to 1 if a firm discloses a MW in an initial Section 404 report, and 0 otherwise, to compare  $\Delta Spread$  of MW firms to  $\Delta Spread$  of non-MW firms. The use of the variable *MW* allows non-MW firms to act as a control for the general increase in credit spreads over the test period that we observe in Table 1. H1 predicts that the estimated coefficient on *MW* is positive.

Model (1) includes controls for factors that previous research finds to influence the cost of debt. We measure the relevant control variables using the change in value ( $\Delta$ ) during the fourth

<sup>14</sup>  $\Delta Spread$  averages (1) multiple trades in a firm's individual debt instruments during a window, and (2) trades in more than one of a firm's debt instruments during a window. In the sample, the mean number of trades in a firm's debt instruments in days  $[-45, -3]$  ( $[+3, +45]$ ) is 210 (204); the median number of trades is 45 (51); and approximately one-third of firms have 20 (27) or fewer trades, while approximately one-third have 100 (110) or more trades. Also, in both windows, the mean (median) number of debt instruments per firm that trade in a window is 2.8 (2.0); and more than 69 percent (96 percent) of firms have one or two (ten or fewer) debt instruments that trade in a window.

quarter of the fiscal year that is reported on in a firm's initial Section 404 report. Measuring the control variables in this manner helps to alleviate the concern that the reaction of a firm's credit spread to the release of its Form 10-K may be a response to the financial information in the Form 10-K rather than the information in the Section 404 report that is included in the Form 10-K.

To control for an expected positive relationship between the default risk of a firm's debt and its cost of debt, we use the variable  $\Delta DefaultRisk$ , where *DefaultRisk* is a firm's score from the bankruptcy model of Ohlson (1980).<sup>15</sup> Based on evidence in Begley et al. (1996) and following the procedure in Mansi et al. (2004), we calculate *DefaultRisk* for each firm using the model coefficients provided by Ohlson (1980). We predict that the estimated coefficient on  $\Delta DefaultRisk$  is positive.

Previous studies often include controls for firm size, profitability, leverage, and cash flow volatility in models that estimate a firm's cost of debt (e.g., Petersen and Rajan 1994; Sengupta 1998; Kim et al. 2011). For this reason, Model (1) includes the variables  $\Delta Size$  (change in the log of total assets),  $\Delta CFO$  (change in cash flow from operations scaled by total assets),  $\Delta Leverage$  (change in long-term debt scaled by total assets), and  $\Delta CFVol$  (change in the standard deviation over the last 20 quarters of cash flow from operations scaled by total assets).<sup>16,17</sup> Based on the results of the studies cited above, we predict that the estimated coefficients on  $\Delta Size$  and  $\Delta CFO$  are negative, and the estimated coefficients on  $\Delta Leverage$  and  $\Delta CFVol$  are positive.

The finance literature documents, theoretically and empirically, that changes in credit spreads are negatively associated with changes in Treasury rates, especially in the short run (e.g., Longstaff and Schwartz 1995; Duffee 1998; Neal et al. 2001). Based on this evidence, Model (1) includes the variable  $\Delta TrsYTM$ . For each sample firm *i*,  $\Delta TrsYTM_i$  is equal to the mean of all "YTM on a matched-by-maturity Treasury security" used to calculate *Spread<sub>i</sub>* over days [+3, +45] minus the mean of all "YTM on a matched-by-maturity Treasury security" used to calculate *Spread<sub>i</sub>* over days [-45, -3]. Based on the studies cited above, we predict that the estimated coefficient on  $\Delta TrsYTM$  is negative.

To control for changes in a firm's financial health, Model (1) includes controls for change in the existence of restructuring, writedown, M&A, and/or restatement activity that would be disclosed in the Form 10-K for the fiscal year of a firm's initial Section 404 report.<sup>18</sup> We do not predict a sign for the estimated coefficients on  $\Delta Restructure$  or  $\Delta WriteDown$  because restructuring and writedown activity could be bad news (e.g., a firm is having problems) or good news (e.g., a firm is taking action to resolve its problems). Similarly, we do not predict a sign for the estimated coefficient on  $\Delta M\&A$  because M&A activity could be bad news (e.g., a firm is overpaying) or good news (e.g., a firm is making a sensible acquisition). Finally, we

<sup>15</sup> The factors in the model are log of assets, working capital scaled by assets, total liabilities scaled by total assets, current liabilities scaled by current assets, net income scaled by assets, operating cash flows scaled by liabilities, change in net income scaled by the sum of the absolute values of the prior two years' net income, and two indicator variables. The indicator variables identify (1) firms with negative earnings in the current and previous year, and (2) firms with negative owner's equity in the current year. If we replace  $\Delta DefaultRisk$  with  $\Delta$  for each of the individual factors included in the bankruptcy model of Ohlson (1980), the only notable change in our results is that the estimated coefficient on *MW* in Model (1) is now positive at  $p = 0.153$  (rather than  $p = 0.099$ ).

<sup>16</sup> If we use a measure of  $\Delta CFO$  that attempts to control for seasonality (i.e.,  $\Delta CFO$  as currently measured minus  $\Delta CFO$  for the fiscal year preceding the fiscal year that is reported on in a firm's initial Section 404 report), it is significantly correlated with  $\Delta CFO$  ( $p = 0.001$ ) and there is no notable change in our results.

<sup>17</sup> We do not use change in earnings to measure change in profitability because, as a result of earnings announcements made prior to the release of the Form 10-K, it is likely that credit spreads would have already reacted to the information in change in earnings during the days [-45, -3] window. If we replace  $\Delta CFO$  with "actual annual EPS reported by I/B/E/S minus the most recent (but no more recent than the end of the third quarter) mean I/B/E/S forecast for annual EPS," there is no notable change in our results.

<sup>18</sup>  $\Delta Restructure$ ,  $\Delta WriteDown$ ,  $\Delta M\&A$ , and  $\Delta Restate$  are coded as -1, 0, or 1, as described in Table 2.

predict that the estimated coefficient on  $\Delta Restate$  is positive because a restatement indicates weak internal control over financial reporting.

### Test Results

As reported in Table 2, when we estimate Model (1), the coefficient on *MW* is positive ( $p = 0.099$ ).<sup>19</sup> This result provides marginal support for H1 that the disclosure of a MW in an initial Section 404 report is associated with an increase in a firm's cost of debt.<sup>20</sup> However, this initial result is an average result. It does not provide evidence as to whether the effect of disclosing a MW on the cost of debt holds equally for firms that are monitored and firms that are not monitored by credit rating agencies and/or banks. Therefore, we next explore the impact of monitoring.

### Tests of H2a and H2b: Monitoring Effects

#### Test Design

To examine the monitoring hypotheses, which predict that the evidence supporting H1 is stronger for firms that are not monitored by credit rating agencies and/or banks compared to firms that are monitored, we estimate Model (2):

$$\Delta Spread = \alpha_0 + \beta_0 MW + \beta_1 Monitored + \beta_2 MW * Monitored + \beta_n Model\ I\ Controls + \varepsilon. \quad (2)$$

Model (2) employs a difference in difference-in-differences test design. The innovation in Model (2) is that the coefficient  $\beta_2$  tests the difference between (1) the difference in  $\Delta Spread$  between MW and non-MW firms for monitored firms, and (2) the difference in  $\Delta Spread$  between MW and non-MW firms for unmonitored firms. This innovation allows us to test whether the evidence supporting H1 is stronger for unmonitored firms. The monitoring hypotheses predict that the estimated coefficient  $\beta_2$  is negative.

#### Test Results for Monitoring by Credit Rating Agencies

To test the effect of monitoring by credit rating agencies, we measure *Monitored* using an indicator variable *Rated*, set equal to 1 if a firm's debt is rated by S&P and/or Moody's, and 0 otherwise. To determine if S&P rates a firm's debt, we use the S&P credit rating variable available in Compustat. Further, to determine if Moody's rates a firm's debt, we consult the [Mergent Bond Record as of January 2005 \(Mergent Inc. 2005\)](#), which lists debt issues that Moody's rates.

In our sample of 577 firms, there are 489 firms with rated debt and 88 firms with unrated debt.<sup>21</sup> Among the 489 rated firms, there are 456 non-MW and 33 MW firms. Among the 88 unrated firms, there are 75 non-MW and 13 MW firms. As reported in Table 3, Panel A, when we estimate Model (2) using *Rated*, the coefficient  $\beta_2$  is negative ( $p = 0.039$ ), supporting H2a that the

<sup>19</sup> We report p-values of 0.001 or better as  $p = 0.001$ . Reported p-values are based on one-tailed tests. In our tests reported in Tables 2 through 6, the significant results for the control variables with a predicted sign are that the estimated coefficient on  $\Delta CFO$  is negative ( $p = 0.001$ ), the estimated coefficient on  $\Delta CFVol$  is positive (between  $p = 0.003$  and  $p = 0.062$ ), and the estimated coefficient on  $\Delta TrsYTM$  is negative (between  $p = 0.001$  and  $p = 0.011$ ).

<sup>20</sup> Consistent with this finding, in univariate tests, mean  $\Delta Spread$  for MW firms (non-MW firms) is 0.687 (0.368), and the difference in mean  $\Delta Spread$  between the two groups of firms is positive and statistically significant ( $p = 0.047$ ).

<sup>21</sup> [Choi and Richardson \(2010\)](#), in Panel A of Table 2, report that among their 1,566 sample firms with publicly traded bonds, 266 firms (16.99 percent) are unrated, which is close to our finding that 15.25 percent of our sample firms are unrated.

TABLE 2

## Analysis of the Change in a Firm's Credit Spread following an Initial Section 404 Report

$\Delta Spread =$			Coefficient	p-value <sup>a</sup>
Constant			0.717	0.001
<i>MW</i>	$\beta_0$	+	0.242	0.099
$\Delta DefaultRisk$	$\beta_1$	+	-0.051	0.782
$\Delta Size$	$\beta_2$	-	0.369	0.787
$\Delta CFO$	$\beta_3$	-	-6.025	0.001
$\Delta Leverage$	$\beta_4$	+	0.338	0.365
$\Delta CFVol$	$\beta_5$	+	19.192	0.005
$\Delta TrsYTM$	$\beta_6$	-	-1.084	0.001
$\Delta Restructure$	$\beta_7$		0.234	0.107
$\Delta WriteDown$	$\beta_8$		-0.343	0.033
$\Delta M\&A$	$\beta_9$		-0.053	0.457
$\Delta Restate$	$\beta_{10}$	+	-0.143	0.899
Adjusted R <sup>2</sup>			0.080	

<sup>a</sup> p-values are one-tailed, and  $p = 0.001$  indicates that  $p$  is less than or equal to 0.001. p-values exceeding 0.500 indicate that the sign of an estimated coefficient is not in the predicted direction.

The variables (followed by predicted signs) in the OLS regression model reported in this table are as follows.

Dependent variable: The change in a firm's credit spread around an initial Section 404 report ( $\Delta Spread$ ), computed as follows. We measure the credit spread for individual trades in a firm's debt instruments as YTM on the relevant debt issue minus YTM on a matched-by-maturity Treasury security. We calculate the mean pre- (post-) report credit spread for each firm (i.e., *Spread*) as the mean credit spread for all TRACE-reported trades occurring over days  $[-45, -3]$  ( $[-3, +45]$ ) relative to the initial Section 404 report filing date. We calculate the change in credit spread for each firm as its mean post-report credit spread minus its mean pre-report credit spread.

RHS variables:

*MW* = 1 if a firm discloses a MW in an initial Section 404 report, and 0 otherwise;

$\Delta DefaultRisk$  = change in the score from the bankruptcy model of Ohlson (1980);

$\Delta Size$  = change in the log of total assets;

$\Delta CFO$  = change in cash flow from operations scaled by total assets;

$\Delta Leverage$  = change in long-term debt scaled by total assets;

$\Delta CFVol$  = change in standard deviation over the last 20 quarters of cash flow from operations scaled by total assets, where change in these " $\Delta$  variables" is change in value during the fourth quarter of the fiscal year that is reported on in a firm's initial Section 404 report (Q4);

For each sample firm  $i$ ,  $\Delta TrsYTM_i$  = the mean of all "YTM on a matched-by-maturity Treasury security" used to calculate  $Spread_i$  over days  $[-3, +45]$  minus the mean of all "YTM on a matched-by-maturity Treasury security" used to calculate  $Spread_i$  over days  $[-45, -3]$ ;

$\Delta Restructure$  = 1 if restructuring activity occurs in Q4 but not in the preceding quarter, Q3 (equal to -1 if restructuring activity occurs in Q3 but not in Q4; equal to 0 if restructuring activity occurs in both Q3 and Q4 or if no restructuring activity occurs in either Q3 or Q4); and

$\Delta WriteDown$ ,  $\Delta M\&A$ , and  $\Delta Restate$  are measured in a manner similar to  $\Delta Restructure$  to reflect changes in writedown, M&A, and restatement activity, respectively. Due to data constraints,  $\Delta Restate$  is measured for the fiscal year (rather than Q4) that is reported on in a firm's initial Section 404 report.

The construction of the sample of 577 (531 non-MW and 46 MW) firms is described in Table 1.

increased cost of debt associated with MW disclosure is more pronounced for firms with unrated debt than for firms with rated debt.

Next, we assess the impact of reporting a MW on  $\Delta Spread$  for (1) only firms with rated debt, and (2) only firms with unrated debt. In terms of Model (2), the relevant tests are based on (1) the sum of the estimated coefficients  $\beta_0 + \beta_2$  for firms with rated debt, and (2) the estimated coefficient  $\beta_0$  for firms with unrated debt. As reported in Table 3, Panel A, the sum of the estimated

TABLE 3

**Analysis of the Change in a Firm's Credit Spread Following an Initial Section 404 Report  
with Independent Controls for Monitoring**

**Panel A: Control for Monitoring by Credit Rating Agencies**

<u><math>\Delta Spread =</math></u>			<u>Coefficient</u>	<u>p-value<sup>a</sup></u>
Constant			0.565	0.001
<i>MW</i>	$\beta_0$	+	0.798	0.014
<i>Rated</i>	$\beta_1$		-0.193	0.114
<i>MW * Rated</i>	$\beta_2$	-	-0.742	0.039
$\Delta DefaultRisk$	$\beta_3$	+	-0.060	0.818
$\Delta Size$	$\beta_4$	-	0.289	0.731
$\Delta CFO$	$\beta_5$	-	-6.307	0.001
$\Delta Leverage$	$\beta_6$	+	0.410	0.340
$\Delta CFVol$	$\beta_7$	+	20.879	0.003
$\Delta TrsYTM$	$\beta_8$	-	-1.098	0.001
$\Delta Restructure$	$\beta_9$		0.228	0.112
$\Delta WriteDown$	$\beta_{10}$		-0.339	0.034
$\Delta M\&A$	$\beta_{11}$		-0.075	0.439
$\Delta Restate$	$\beta_{12}$	+	-0.155	0.917
Adjusted R <sup>2</sup>			0.083	
Sum of coefficients				
$MW + MW * Rated (\beta_0 + \beta_2)$		+	0.056	0.400

**Panel B: Control for Monitoring by Banks**

<u><math>\Delta Spread =</math></u>			<u>Coefficient</u>	<u>p-value<sup>a</sup></u>
Constant			0.796	0.001
<i>MW</i>	$\beta_0$	+	1.434	0.001
<i>Bank</i>	$\beta_1$		-0.119	0.235
<i>MW * Bank</i>	$\beta_2$	-	-1.744	0.001
$\Delta DefaultRisk$	$\beta_3$	+	-0.038	0.722
$\Delta Size$	$\beta_4$	-	0.190	0.662
$\Delta CFO$	$\beta_5$	-	-5.079	0.001
$\Delta Leverage$	$\beta_6$	+	-0.211	0.586
$\Delta CFVol$	$\beta_7$	+	15.915	0.016
$\Delta TrsYTM$	$\beta_8$	-	-1.111	0.001
$\Delta Restructure$	$\beta_9$		0.270	0.072
$\Delta WriteDown$	$\beta_{10}$		-0.283	0.062
$\Delta M\&A$	$\beta_{11}$		-0.060	0.451
$\Delta Restate$	$\beta_{12}$	+	-0.116	0.854
Adjusted R <sup>2</sup>			0.114	
Sum of coefficients				
$MW + MW * Bank (\beta_0 + \beta_2)$		+	-0.310	0.922

<sup>a</sup> p-values are one-tailed, and  $p = 0.001$  indicates that  $p$  is less than or equal to 0.001. p-values exceeding 0.500 indicate that the sign of an estimated coefficient is not in the predicted direction.

The variables (followed by predicted signs) in the OLS regression models reported in this table are as follows:

Dependent Variable: The change in a firm's credit spread around an initial Section 404 report ( $\Delta Spread$ ) is defined in Table 2.

*(continued on next page)*

TABLE 3 (continued)

RHS variables:

Panel A: *Rated* = 1 if a firm's debt is rated by S&P and/or Moody's (489 firms: 456 are non-MW firms and 33 are MW firms), and 0 otherwise (88 firms: 75 are non-MW firms and 13 are MW firms).

Panel B: *Bank* = 1 if a firm has a new or revised bank loan agreement in any year from 1988 to 2005 (500 firms: 468 are non-MW firms and 32 are MW firms), and 0 otherwise (77 firms: 63 are non-MW firms and 14 are MW firms).

Panels A and B: *MW*,  $\Delta\text{DefaultRisk}$ ,  $\Delta\text{Size}$ ,  $\Delta\text{CFO}$ ,  $\Delta\text{Leverage}$ ,  $\Delta\text{CFVol}$ ,  $\Delta\text{TrsYTM}$ ,  $\Delta\text{Restructure}$ ,  $\Delta\text{WriteDown}$ ,  $\Delta\text{M\&A}$ , and  $\Delta\text{Restate}$  are defined in Table 2.

The construction of the sample of 577 (531 non-MW and 46 MW) firms is described in Table 1.

coefficients  $\beta_0 + \beta_2$  is positive but not statistically significant ( $p = 0.400$ ), and the estimated coefficient  $\beta_0$  is positive and statistically significant ( $p = 0.014$ ). These results provide further support for H2a.<sup>22</sup> Initially, these findings suggest that monitoring by credit rating agencies is effective at capturing much of the information provided to the debt market in an initial Section 404 report.

### Test Results for Monitoring by Banks

We now turn to tests of the bank-monitoring hypothesis. To test the effect of monitoring by banks, we measure *Monitored* using an indicator variable *Bank*. To code *Bank*, we first consult the DealScan database to identify sample firms that have a new or revised bank loan agreement in any year from 1988 (the earliest DealScan record for a sample firm) through 2005. We code these firms *Bank* = 1 (i.e., subject to bank monitoring).<sup>23</sup> We then code the remaining sample firms *Bank* = 0.

In our sample of 577 firms, there are 500 firms that are coded *Bank* = 1 (i.e., subject to bank monitoring) and 77 firms that are coded *Bank* = 0. Among the 500 bank-monitored firms, there are 468 non-MW and 32 MW firms. Among the 77 non-bank-monitored firms, there are 63 non-MW and 14 MW firms. Referring to Table 3, Panel B, in the estimate of Model (2) using *Bank*, the coefficient  $\beta_2$  is significantly negative ( $p = 0.001$ ). Thus, the data provide support for H2b that the increased cost of debt associated with MW disclosure is more pronounced for firms that are not subject to bank monitoring than for firms that are subject to bank monitoring.

Next, we assess the impact of reporting a MW on  $\Delta\text{Spread}$  for (1) only bank-monitored firms, and (2) only firms not subject to bank monitoring. As reported in Table 3, Panel B, in this analysis the sum of the estimated coefficients  $\beta_0 + \beta_2$  is negative and the estimated coefficient  $\beta_0$  is positive and statistically significant ( $p = 0.001$ ). These results provide further support for H2b.<sup>24</sup>

<sup>22</sup> Univariate tests highlight the importance of monitoring by credit rating agencies. For rated firms, mean  $\Delta\text{Spread}$  for MW firms (non-MW firms) is 0.453 (0.351), and the difference in mean  $\Delta\text{Spread}$  between the two groups of firms is positive but not significant at conventional levels ( $p = 0.305$ ). For unrated firms, mean  $\Delta\text{Spread}$  for MW firms (non-MW firms) is 1.281 (0.476), and the difference in mean  $\Delta\text{Spread}$  between the two groups of firms is marginally significant ( $p = 0.067$ ).

<sup>23</sup> The DealScan database is compiled using information from SEC filings and self-reported information from participating banks. Some loan packages or deals reported by DealScan can have several facilities for the same borrower. We do not break down such loan packages or deals into individual facilities because we are using DealScan to identify the existence of a new or revised bank loan agreement, which could be a single facility, a loan package, or a deal with several individual facilities. Also, it is not necessarily the case that a new or revised bank loan agreement entered into prior to the initial Section 404 report filing date will still be in effect when the report is filed; we analyze this issue in detail in Section VI.

<sup>24</sup> Univariate tests highlight the importance of bank monitoring. For bank-monitored firms, mean  $\Delta\text{Spread}$  for MW firms (non-MW firms) is 0.079 (0.326), and the difference in mean  $\Delta\text{Spread}$  between the two groups of firms is negative. For firms not subject to bank monitoring, mean  $\Delta\text{Spread}$  for MW firms (non-MW firms) is 2.076 (0.681), and the difference in mean  $\Delta\text{Spread}$  between the two groups of firms is positive and statistically significant ( $p = 0.014$ ).

The preceding findings support both the credit rating agency and the bank-monitoring hypotheses. However, a test is still required to assess whether each of the monitoring effects documented so far has an incremental effect on the relationship between the change in a firm's credit spread and the disclosure of a MW. Therefore, we next test the joint effects of monitoring by credit rating agencies and banks.

### **Test Results for the Joint Effects of Monitoring**

In this section, we test H2a and H2b jointly, using Model (3):

$$\Delta Spread = \alpha_0 + \beta_0 MW + \beta_1 Rated + \beta_2 MW * Rated + \beta_3 Bank + \beta_4 MW * Bank + \beta_5 Rated * Bank + \beta_6 MW * Rated * Bank + \beta_n Model\ I\ Controls + \varepsilon. \quad (3)$$

Model (3) allows us to test the difference between (1) the difference in  $\Delta Spread$  between MW and non-MW firms that have rated debt and are subject to bank monitoring (i.e., the “most monitored” firms), and (2) the difference in  $\Delta Spread$  between MW and non-MW firms that have unrated debt and are not subject to bank monitoring (i.e., the “least monitored” firms). To compare the “most monitored” and the “least monitored” firms, we test the sum of the estimated coefficients  $\beta_2$ ,  $\beta_4$ , and  $\beta_6$ . The monitoring hypotheses predict that the sum of these coefficients is negative. As reported in Table 4, this prediction is supported ( $p = 0.002$ ).<sup>25</sup>

Model (3) also allows us to test whether the monitoring effect of credit rating agencies and that of banks each has its own incremental effect on the relationship between the change in a firm's credit spread and the disclosure of a MW, as opposed to one effect subsuming the other.<sup>26</sup> In our sample, there are 454 firms monitored by both credit rating agencies and banks, 35 firms monitored only by credit rating agencies, 46 firms monitored only by banks, and 42 firms monitored by neither.<sup>27</sup> The relevant tests, predictions, and results (reported in Table 4) comparing these subgroups are as follows:

- For bank-monitored firms, is there a significant difference between (1) the difference in  $\Delta Spread$  between MW and non-MW firms for rated firms, and (2) the difference in  $\Delta Spread$  between MW and non-MW firms for unrated firms? Relevant prediction (H2a): the sum of the estimated coefficients  $\beta_2$  and  $\beta_6$  is negative. Result: the data fail to support this prediction ( $p = 0.261$ ).
- For firms not subject to bank monitoring, is there a significant difference between (1) the difference in  $\Delta Spread$  between MW and non-MW firms for rated firms, and (2) the difference in  $\Delta Spread$  between MW and non-MW firms for unrated firms? Relevant prediction (H2a): the estimated coefficient  $\beta_2$  is negative. Result: the data fail to support this prediction (i.e., the estimated coefficient  $\beta_2$  is positive).

<sup>25</sup> Univariate tests highlight the importance of monitoring. For firms that have rated debt and are subject to bank monitoring, mean  $\Delta Spread$  for MW firms (non-MW firms) is 0.038 (0.335), and the difference in mean  $\Delta Spread$  between the two groups of firms is negative. For firms that have unrated debt and are not subject to bank monitoring, mean  $\Delta Spread$  for MW firms (non-MW firms) is 1.893 (0.774), and the difference in mean  $\Delta Spread$  between the two groups of firms is positive and marginally significant ( $p = 0.084$ ).

<sup>26</sup> For example, if a firm is both rated and subject to bank monitoring, it is possible that the contribution of this firm to the significant “monitoring matters” results could be caused by the fact that the firm is rated, by the fact that the firm is bank-monitored, or by both. In other words, when we measure *Monitored* in Model (2) using the indicator variable *Rated (Bank)*, *Bank (Rated)* may be a correlated omitted variable. Model (3) attempts to get at this type of issue.

<sup>27</sup> Among the 454 firms monitored by both credit rating agencies and banks, there are 427 non-MW and 27 MW firms. Among the 35 firms monitored only by credit rating agencies, there are 29 non-MW and six MW firms. Among the 46 firms monitored only by banks, there are 41 non-MW and five MW firms. Among the 42 firms monitored by neither, there are 34 non-MW and eight MW firms. In Section VII, we discuss the fact that some of the MW sample cells used in these joint tests are quite small.



**TABLE 4**  
**Analysis of the Change in a Firm's Credit Spread Following an Initial Section 404 Report with Joint Controls for Monitoring**

$\Delta Spread =$		Coefficient	p-value <sup>a</sup>
Constant		0.781	0.001
<i>MW</i>	$\beta_0$	1.161	0.007
<i>Rated</i>	$\beta_1$	0.038	0.451
<i>MW * Rated</i>	$\beta_2$ -	0.612	0.806
<i>Bank</i>	$\beta_3$	-0.349	0.107
<i>MW * Bank</i>	$\beta_4$ -	-1.132	0.059
<i>Rated * Bank</i>	$\beta_5$	0.249	0.244
<i>MW * Rated * Bank</i>	$\beta_6$	-0.998	0.143
$\Delta DefaultRisk$	$\beta_7$ +	-0.053	0.790
$\Delta Size$	$\beta_8$ -	0.229	0.690
$\Delta CFO$	$\beta_9$ -	-5.342	0.001
$\Delta Leverage$	$\beta_{10}$ +	0.000	0.500
$\Delta CFVol$	$\beta_{11}$ +	16.509	0.015
$\Delta TrsYTM$	$\beta_{12}$ -	-1.143	0.001
$\Delta Restructure$	$\beta_{13}$	0.281	0.065
$\Delta WriteDown$	$\beta_{14}$	-0.274	0.068
$\Delta M\&A$	$\beta_{15}$	-0.095	0.422
$\Delta Restate$	$\beta_{16}$ +	-0.112	0.845
Adjusted R <sup>2</sup>		0.113	
Sums of coefficients			
<i>MW * Rated</i> + <i>MW * Bank</i> + <i>MW * Rated * Bank</i> ( $\beta_2 + \beta_4 + \beta_6$ )	-	-1.518	0.002
<i>MW * Rated</i> + <i>MW * Rated * Bank</i> ( $\beta_2 + \beta_6$ )	-	-0.386	0.261
<i>MW * Bank</i> + <i>MW * Rated * Bank</i> ( $\beta_4 + \beta_6$ )	-	-2.130	0.001

<sup>a</sup> p-values are one-tailed, and  $p = 0.001$  indicates that  $p$  is less than or equal to 0.001. p-values exceeding 0.500 indicate that the sign of an estimated coefficient is not in the predicted direction.

The variables (followed by predicted signs) in the OLS regression model reported in this table are as follows:

Dependent variable: The change in a firm's credit spread around an initial Section 404 report ( $\Delta Spread$ ) is defined in Table 2.

RHS variables: *MW*,  $\Delta DefaultRisk$ ,  $\Delta Size$ ,  $\Delta CFO$ ,  $\Delta Leverage$ ,  $\Delta CFVol$ ,  $\Delta TrsYTM$ ,  $\Delta Restructure$ ,  $\Delta WriteDown$ ,  $\Delta M\&A$ , and  $\Delta Restate$  are defined in Table 2. *Rated* and *Bank* are defined in Table 3.

The construction of the sample of 577 (531 non-MW and 46 MW) firms is described in Table 1.

- For rated firms, is there a significant difference between (1) the difference in  $\Delta Spread$  between MW and non-MW firms for bank-monitored firms, and (2) the difference in  $\Delta Spread$  between MW and non-MW firms for firms not subject to bank monitoring? Relevant prediction (H2b): the sum of the estimated coefficients  $\beta_4$  and  $\beta_6$  is negative. Result: the data provide strong support for this prediction ( $p = 0.001$ ).
- For unrated firms, is there a significant difference between (1) the difference in  $\Delta Spread$  between MW and non-MW firms for bank-monitored firms, and (2) the difference in  $\Delta Spread$  between MW and non-MW firms for firms not subject to bank monitoring? Relevant prediction (H2b): the estimated coefficient  $\beta_4$  is negative. Result: the data provide marginal support for this prediction ( $p = 0.059$ ).

The preceding tests suggest that bank monitoring subsumes monitoring by credit rating agencies with regards to the post-report response of credit spread to the disclosure of a MW in an

initial Section 404 report. Of primary interest are the third and fourth results, which suggest that bank monitoring reduces the impact of reporting a MW in an initial Section 404 report regardless of credit rating status. These results suggest that the effect of bank monitoring may be the primary driver of our more general “monitoring matters” results.

### Test of H3: Delinquent Filers

We now test whether there is a difference in the change in credit spread between firms that are delinquent in filing an initial Section 404 report and timely filers. We classify a firm as a delinquent filer if it does not file an initial Section 404 report within 90 days of its fiscal year-end.<sup>28</sup> Conversely, a timely filer is defined as a firm that files an initial Section 404 report within 90 days of its fiscal year-end.

For each delinquent and timely filer, we measure the change in credit spread ( $\Delta Spread(adjusted)$ ) around this 90-day cutoff as the mean credit spread for all TRACE-reported trades in a firm’s debt issues over days [+3, +45] minus the mean credit spread for all TRACE-reported trades over days [-45, -3] relative to the 90-day cutoff. We then use the 544 sample firms (533 timely filers and 11 delinquent filers) with complete data availability, as of the 90-day cutoff, to estimate a regression of  $\Delta Spread(adjusted)$  on *Delinquent* and the control variables included in our previous models. *Delinquent* is equal to 1 if a firm is a delinquent filer, and 0 otherwise. As reported in Table 5, the estimated coefficient on *Delinquent* is significantly positive ( $p = 0.001$ ).<sup>29</sup> Consistent with [Ogneva et al.’s \(2007\)](#) finding for the cost of equity, the result for *Delinquent* indicates that delinquent filers experience a significant increase in credit spread relative to timely filers.

## V. COMPARISON TO THE COST OF EQUITY RESULTS IN ASHBAUGH-SKAIFE ET AL. (2009)

In this section, we compare our findings to those of [Ashbaugh-Skaife et al. \(2009\)](#), which focus on the cost of equity rather than the cost of debt. We begin by partitioning the data by the *ex ante* probability of reporting a MW, which allows for a more direct comparison between the two studies.<sup>30</sup> To partition the data, we first estimate the logistic probability model in [Ashbaugh-Skaife et al. \(2007\)](#), using all the firms we identified as releasing an initial Section 404 report between November 3, 2004, and March 3, 2006, that have the data necessary to estimate the model.<sup>31</sup> Next, we determine the overlap between the firms in the upper and lower halves of the resulting *ex ante* probability of reporting a MW distribution and the 577 firms in the sample used to estimate our earlier models. These procedures result in a sample of 506 firms: 24 MW (134 non-MW) firms in

<sup>28</sup> The SEC filing requirement in effect for Form 10-Ks during our sample period is 75 days for accelerated filers, with an extra 15 days allowed to file without penalty. SEC Release No. 34-50754 ([SEC 2004](#)) grants an additional 45 days beyond the 75-day filing requirement for small accelerated filers to file a Section 404 report. We choose the 90-day cutoff because we view failing to meet this deadline as an appropriate indicator of pervasive internal control over financial reporting problems.

<sup>29</sup> Consistent with this result, in univariate tests, mean  $\Delta Spread$  for delinquent firms (timely filers) is 2.097 (0.532), and the difference in mean  $\Delta Spread$  between the two groups of firms is positive and statistically significant ( $p = 0.001$ ).

<sup>30</sup> We choose [Ashbaugh-Skaife et al.’s \(2009\)](#) results as our benchmark because their test design is similar to ours. [Ashbaugh-Skaife et al.’s \(2009\)](#) results do not provide a strict “apples to apples” comparison, primarily because they examine the disclosure of a Section 302 MW or a Section 404 MW.

<sup>31</sup> The determinants in the model are number of business segments, decile rank of sales growth, inventory to assets ratio, proportion of three preceding years with negative earnings, decile rank of [Altman \(1968\)](#) z-score, percent of shares held by institutional investors divided by number of institutional owners, market value of equity, and indicator variables for foreign sales, M&A activity, restructuring, auditor resignation, earnings restatement, membership in a litigious industry, and use of a large auditor.

TABLE 5

## Analysis of the Change in a Firm's Credit Spread: Timely versus Delinquent Filers

$\Delta Spread(adj) =$		Coefficient	p-value <sup>a</sup>
Constant		0.801	0.001
<i>Delinquent</i>	+	1.485	0.001
$\Delta DefaultRisk$	+	-0.031	0.653
$\Delta Size$	-	0.399	0.759
$\Delta CFO$	-	-5.946	0.001
$\Delta Leverage$	+	0.593	0.318
$\Delta CFVol$	+	13.747	0.062
$\Delta TrsYTM$	-	-0.518	0.011
$\Delta Restructure$		0.005	0.490
$\Delta WriteDown$		-0.283	0.096
$\Delta M\&A$		-0.164	0.385
$\Delta Restate$	+	-0.009	0.527
Adjusted R <sup>2</sup>		0.046	

<sup>a</sup> p-values are one-tailed and  $p = 0.001$  indicates that  $p$  is less than or equal to 0.001. p-values exceeding 0.500 indicate that the sign of the estimated coefficient is not in the predicted direction.

The variables (followed by predicted signs) in the OLS regression model reported in this table are as follows:

Dependent variable: The change in a firm's credit spread ( $\Delta Spread(adj)$ ), computed as follows. We measure the credit spread for individual trades in a firm's debt instruments as YTM on the relevant debt issue minus YTM on a matched-by-maturity Treasury security. We calculate the mean pre- (post-) cutoff date credit spread for each firm as the mean credit spread for all TRACE-reported trades occurring over days  $[-45, -3]$  ( $[-3, +45]$ ) relative to the cutoff of 90 days after a firm's fiscal year-end. We calculate the change in credit spread for each firm as its mean post-cutoff credit spread minus its mean pre-cutoff credit spread.

RHS variables: *Delinquent* = 1 if a firm does not file an initial Section 404 report within 90 days of its fiscal year-end, and 0 otherwise.  $\Delta DefaultRisk$ ,  $\Delta Size$ ,  $\Delta CFO$ ,  $\Delta Leverage$ ,  $\Delta CFVol$ ,  $\Delta TrsYTM$ ,  $\Delta Restructure$ ,  $\Delta WriteDown$ ,  $\Delta M\&A$ , and  $\Delta Restate$  are defined in Table 2.

Among the 577 sample firms described in Table 1 that have complete data availability as of the 90-day cutoff date for the Table 5 tests, there are 533 firms that file a timely report, and 11 firms that are delinquent filers.

the upper half of the *ex ante* probability of reporting a MW distribution, and 16 MW (332 non-MW) firms in the lower half. The 158 firms in the upper half of the distribution are coded *HighProb* = 1 and the 348 firms in the lower half are coded *HighProb* = 0.

For these 506 firms, we estimate a regression of  $\Delta Spread$  on *MW*, *HighProb*, *MW \* HighProb*, and the control variables included in our previous models. As reported in Table 6, the estimated coefficient on *MW \* HighProb* is significantly negative ( $p = 0.001$ ). This result is consistent with the notion that firms with a low *ex ante* probability of reporting a MW have a larger increase in credit spread in response to reporting a MW than firms with a high *ex ante* probability because the debt market is more surprised when a low *ex ante* probability firm reveals a MW.

Comparing our test results to those in Ashbaugh-Skaife et al. (2009), similar to their finding that a firm's cost of equity increases if it discloses a MW, we find that the disclosure of a MW is associated with an increase in a firm's cost of debt. Also, both studies find evidence consistent with the notion that firms with a low *ex ante* probability of reporting a MW have a larger increase in their cost of capital in response to reporting a MW than high *ex ante* probability firms.

When we partition our sample firms based on whether a firm is monitored by credit rating agencies and/or banks, we observe that the increased cost of debt associated with MW disclosure is more pronounced for firms that are not monitored than for firms that are monitored. Ashbaugh-Skaife et al. (2009) do not examine the impact of monitoring on the cost of equity. An interesting issue for future research to examine is whether there are alternate monitoring

TABLE 6

**Analysis of the Change in a Firm's Credit Spread Following an Initial Section 404 Report  
with Control for Probability of Reporting a MW**

<u><math>\Delta Spread =</math></u>		<u>Coefficient</u>	<u>p-value<sup>a</sup></u>
Constant		0.630	0.001
<i>MW</i>		1.358	0.001
<i>HighProb</i>		0.299	0.017
<i>MW * HighProb</i>	-	-1.756	0.001
$\Delta DefaultRisk$	+	0.001	0.493
$\Delta Size$	-	0.275	0.714
$\Delta CFO$	-	-6.180	0.001
$\Delta Leverage$	+	0.513	0.315
$\Delta CFVol$	+	22.789	0.003
$\Delta TrsYTM$	-	-1.035	0.001
$\Delta Restructure$		0.360	0.038
$\Delta WriteDown$		-0.498	0.007
$\Delta M\&A$		0.017	0.486
$\Delta Restate$	+	-0.118	0.829
Adjusted R <sup>2</sup>		0.119	

<sup>a</sup> p-values are one-tailed and p = 0.001 indicates that p is less than or equal to 0.001. p-values exceeding 0.500 indicate that the sign of an estimated coefficient is not in the predicted direction.

The variables (followed by predicted signs) in the OLS regression model reported in this table are as follows:

Dependent variable: The change in a firm's credit spread around an initial Section 404 report ( $\Delta Spread$ ) is defined in Table 2.

RHS variables: *MW*,  $\Delta DefaultRisk$ ,  $\Delta Size$ ,  $\Delta CFO$ ,  $\Delta Leverage$ ,  $\Delta CFVol$ ,  $\Delta TrsYTM$ ,  $\Delta Restructure$ ,  $\Delta WriteDown$ ,  $\Delta M\&A$ , and  $\Delta Restate$  are defined in Table 2.

Using all the firms we identified as releasing an initial Section 404 report between November 3, 2004, and March 3, 2006, that have the necessary data, we use the logistic probability model in Ashbaugh-Skaife et al. (2007) to estimate the *ex ante* probability of reporting a MW. Next, we determine the overlap between the firms in the upper and lower halves of the resulting *ex ante* probability of reporting a MW distribution and the 577 firms in the sample described in Table 1, resulting in 24 MW (134 non-MW) firms in the upper half of the distribution and 16 MW (332 non-MW) firms in the lower half. These 506 firms are used to estimate the model in Table 6. For these 506 firms, the 158 firms in the upper half of the *ex ante* probability of reporting a MW distribution are coded *HighProb* = 1, and the 348 firms in the lower half are coded *HighProb* = 0.

mechanisms in the equity market (e.g., analyst following) that impact the relationship between the change in a firm's cost of equity and the disclosure of a MW. Another issue future research might consider is a test of the differential effect of various monitoring agents (e.g., banks, credit rating agencies, audit committees, an independent press) on (1) the change in a firm's cost of equity and the disclosure of a MW, and (2) the change in a firm's cost of debt and the disclosure of a MW.

## VI. ADDITIONAL ANALYSES

### Tests that Classify MW Firms by Severity of MW

Moody's Investors Service, Inc. (2004) classifies a Section 404 MW as either Category A or Category B, as follows:

- A Category A MW relates to controls over specific accounts or transaction-level processes. In general, Moody's does not bring firms with a Category A MW to their rating committee to determine if a credit rating downgrade is necessary.

- A Category B MW relates to company-level control factors such as the control environment. In general, Moody's brings firms with a Category B MW to their rating committee to determine if a credit rating downgrade is necessary.

A Special Comment of [Moody's Investors Service, Inc. \(2005b\)](#) identifies firms with Category A or Category B MW. The Special Comment discusses 18 of our 46 sample MW firms. Among these 18 firms, 11 are classified as Category A and seven are classified as Category B. To determine if MW classification (i.e., as Category A or Category B) impacts the post-initial Section 404 report change in credit spread for MW firms, we use the 18 MW firms just described to estimate a regression of  $\Delta Spread$  on  $ABIndicator$  (equal to 1 for Category B firms, and 0 for Category A firms) and the control variables included in our previous models. In this estimate (not tabled), the coefficient on  $ABIndicator$  is positive, as expected, but not statistically significant ( $p = 0.274$ ).

### Additional Analysis of DealScan Data

It is not necessarily the case that a new or revised bank loan agreement entered into prior to the initial Section 404 report filing date will still be in effect when the report is filed. Thus, it is possible that the variable *Bank*, coded as 1 if a firm has a new or revised bank loan agreement in any year from 1988 through 2005, and 0 otherwise, has measurement error. In particular, some firms, coded  $Bank = 1$ , may no longer be subject to bank monitoring because all previous bank loan agreements identified on DealScan have expired as of the initial Section 404 report filing date.<sup>32</sup> In this section, we analyze the DealScan data to assess the sensitivity of our results to this issue.

When we conduct a detailed analysis of the DealScan data for our firms, 86 percent of the firms coded as subject to bank monitoring have at least one new or revised bank loan agreement in the 2003 to 2005 window. Also, among the 14 percent of firms whose most recent new or revised bank loan agreement occurs before 2003, for all but ten of these firms, the most recent agreement is either a long-term revolving line of credit or a term loan.<sup>33</sup> Thus, for all but ten sample firms, the most recent new or revised bank loan agreement either (1) occurs in a relatively short window preceding the initial Section 404 report filing date, or (2) involves a loan that is presumably of a long-term nature. We interpret these observations as suggesting that it is reasonable to code *Bank* using our long coding window, especially given the miscoding issue involved using a short coding window (see footnote 32).

### Tests of Change in Credit Rating

Several previous studies examine the relationship between credit rating and MW status. Using cross-sectional tests, [Elbannan \(2009\)](#) finds that firms that disclose a Section 302 MW or a Section 404 MW have relatively low credit ratings. Using changes tests, [Crabtree et al. \(2009\)](#) find that the disclosure of a MW in an initial Section 404 report is associated with a rating downgrade. In this section, we test whether it is the case for our sample firms that the disclosure of a MW in an initial Section 404 report is associated with a rating downgrade. Our tests regress  $\Delta Rating$  on the variables

<sup>32</sup> We note that the choice of a long coding window is based on a trade-off. If a short window is used, firms that enter into a still-active bank loan agreement prior to the short window will be miscoded  $Bank = 0$  (as opposed to the miscoded  $Bank = 1$  firms that result from using a long window).

<sup>33</sup> If we remove the ten problem firms from the sample and estimate our models that include the variable *Bank*, there is no notable change in our results.

included in our previous models, where  $\Delta Rating$  is the change in a firm's credit rating after a Section 404 report is filed.<sup>34</sup>

In this analysis, there are 480 (450 non-MW and 30 MW) firms from the original sample that have the necessary ratings data. We are unable to estimate models that include the variable *Rated* because all firms in these tests are rated. Table 7 summarizes the distribution of MW and non-MW observations across various credit rating classes in both the pre-Section 404 report period and the post-Section 404 report period. Consistent with the claim of credit rating agencies that their ratings reflect internal control deficiencies before they are eventually disclosed in a Section 404 report (e.g., [Standard & Poor's \[S&P\] 2004](#); [Moody's Investors Service, Inc. 2005b](#)), MW firms tend to fall within the lower credit rating classes in the pre-Section 404 report period. Also, in the pre-Section 404 report period, the mean credit rating for MW firms is significantly worse than that of non-MW firms ( $p = 0.001$ ; untabulated).

In our model estimates using  $\Delta Rating$  (untabulated), the coefficient on *MW* in revised Model (1) is not statistically significant ( $p = 0.118$ ). In revised Model (2), the coefficient on *MW \* Bank*, the coefficient on *MW*, and the sum of the coefficients on *MW* and *MW \* Bank* each fail to reach statistical significance (most significant  $p = 0.214$ ). These results suggest that, consistent with the claim of credit rating agencies that their ratings reflect internal control deficiencies before they are eventually disclosed in a Section 404 report, credit ratings do not appear to be very sensitive to the disclosure of a MW in an initial Section 404 report.

### Comparison to the Results in [Kim et al. \(2011\)](#) and [Costello and Wittenberg-Moerman \(2011\)](#)

Concurrent studies by [Kim et al. \(2011\)](#) and [Costello and Wittenberg-Moerman \(2011\)](#) use bank loan credit spreads to examine some of the same issues investigated in our study. Both [Kim et al. \(2011\)](#) and [Costello and Wittenberg-Moerman \(2011\)](#) find that there is an increase in a firm's cost of debt for new bank loans initiated after reporting a MW. Based on these findings, we view [Kim et al. \(2011\)](#), [Costello and Wittenberg-Moerman \(2011\)](#), and our study as complementary in that they collectively provide evidence that Sarbanes-Oxley reporting requirements can impact a firm's cost of debt in both the private debt market and the public debt market.

We note here that there are many differences in test design among the three studies described in this section. To provide three examples, we observe the following:

- In difference-in-differences tests, our study focuses on changes in the cost of debt for *existing* public debt issues, while [Kim et al. \(2011\)](#) and [Costello and Wittenberg-Moerman \(2011\)](#) focus on changes in the cost of debt for *new* bank loans initiated after reporting a MW.
- In difference-in-differences tests, the test window in our study is 90 days, the test window in [Kim et al. \(2011\)](#) is up to four years, and the test window in [Costello and Wittenberg-Moerman \(2011\)](#) exceeds three years.
- In our study and [Kim et al. \(2011\)](#), the major focus is on Section 404 disclosures, while in [Costello and Wittenberg-Moerman \(2011\)](#), the major focus is on Section 302 disclosures.

Despite differences in test design, all three studies described in this section find evidence that a firm's cost of debt increases after it discloses a MW, suggesting that one benefit of Sarbanes-Oxley

<sup>34</sup> Credit rating data are from the Compustat Ratings File, which reports monthly long-term issuer credit ratings for firms in the S&P 1500. We measure  $\Delta Rating$  as *Rating* at the end of month  $m + 1$  minus *Rating* at the beginning of month  $m - 1$ , where  $m$  is the initial Section 404 report filing month. *Rating* in a given month is coded as in the Compustat Ratings File (e.g., AAA = 2, AA+ = 4, AA = 5, AA- = 6, A+ = 7, and so forth).

**TABLE 7**  
**Distribution of MW and Non-MW Observations across Credit Rating Classes**

	Non-MW Firms Pre-404	Non-MW Firms Post-404	MW Firms Pre-404	MW Firms Post-404
S&P Credit Rating				
AAA rating	0.4%	0.4%	0.0%	0.0%
AA rating range	2.9%	2.9%	0.0%	0.0%
A rating range	20.4%	20.4%	6.7%	6.7%
BBB rating range	34.1%	33.4%	13.3%	13.3%
BB rating range	26.2%	27.3%	36.7%	33.3%
B rating range	15.3%	14.9%	40.0%	43.4%
CCC+ or below	0.7%	0.7%	3.3%	3.3%
Summary				
A- or above rating	23.7%	23.7%	6.7%	6.7%
Rating from BBB+ to B-	75.6%	75.6%	90.0%	90.0%
Rating below B-	0.7%	0.7%	3.3%	3.3%

The largest percentage in each column is rounded up or down by 0.1 percent to achieve 100 percent overall.

Table 7 reports the distribution of MW and non-MW observations across various credit rating classes in month  $m - 1$  ("Pre-404" columns) and in month  $m + 1$  ("Post-404" columns). Credit rating in month  $m - 1$  is credit rating at the beginning of the month preceding the month of an initial Section 404 report. Credit rating in month  $m + 1$  is credit rating at the end of the month following the month of an initial Section 404 report. There are 450 non-MW firms and 30 MW firms in the sample used to construct Table 7. These are the firms that are included in the sample of 577 firms described in Table 1 that also have the necessary ratings data available in the Compustat Ratings File, which reports monthly long-term issuer credit ratings for firms in the S&P 1500.

is that its reporting requirements provide new information to both the private debt market and the public debt market.

## VII. SUMMARY

We find marginal support for the hypothesis that, on average, the disclosure of a MW in an initial Section 404 report is associated with an increase in the cost of a firm's publicly traded debt. Further analysis indicates that this average finding does not hold equally between firms that are monitored and firms that are not monitored by credit rating agencies and/or banks. Specifically, we find that the increased cost of debt associated with MW disclosure is more pronounced for firms that are not monitored than for firms that are monitored. Consistent with the argument that banks are effective delegated monitors for the debt market, additional analysis indicates that the effect of bank monitoring appears to be the primary driver of these monitoring results.

When we compare our results to the corresponding cost of equity results in Ashbaugh-Skaife et al. (2009), our additional tests of the impact of monitoring allow us to offer several suggestions for future research. Specifically, we suggest comparing and contrasting the effect of various monitoring agents on (1) the change in a firm's cost of equity and the disclosure of a MW, and (2) the change in a firm's cost of debt and the disclosure of a MW.

Our study tests for a potential benefit of Sarbanes-Oxley, namely, new information provided to the public debt market in a Section 404 report. Testing for the existence of the benefits of Sarbanes-Oxley is important because many corporate executives claim that the costs of Sarbanes-Oxley outweigh the benefits. For example, in an early 2006 Financial Executives Institute survey, more than 80 percent of respondents state that the costs of Sarbanes-Oxley outweigh the benefits (O'Sullivan 2006). Regarding this debate, our results indicate that, on average, a firm's

credit spread on its publicly traded debt increases if it discloses a MW in an initial Section 404 report. This finding suggests that one benefit of Section 404 reporting is that it can provide new information to the public debt market.<sup>35</sup> We hasten to add that this conclusion does not consider whether the costs of complying with Section 404 reporting requirements outweigh the benefits.

We conclude with a discussion of sample size and model fit. Regarding sample size, the number of MW firms in some sample cells is quite small. Thus, we acknowledge that some of our inferences are based on small sample cell sizes. However, we believe that these inferences are reliable given that our population of interest in these cells is relatively small to begin with. For example, in our joint tests of monitoring effects, there are five firms in the cell “MW firms monitored by banks but not by credit rating agencies.” This small sample size is mainly a function of the relatively small population of firms that satisfy all of the following six conditions: (1) are an accelerated filer, (2) report a MW in an initial Section 404 report, (3) do not report a prior Section 302 MW, (4) have publicly traded debt, (5) are not rated by S&P or Moody’s, and (6) have a new or revised bank loan agreement between 1988 and 2005. Regarding model fit, we use changes tests that include variables that attempt to control for factors and events, other than the information in an initial Section 404 report, that could influence the post-report change in a firm’s credit spread. However, given the difficulty of identifying and accurately measuring all such factors and events, we acknowledge that our models could be missing some relevant control variables.

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<sup>35</sup> As noted previously, consistent with this inference, concurrent research by Kim et al. (2011) and Costello and Wittenberg-Moerman (2011) finds evidence suggesting that one benefit of Sarbanes-Oxley is that its reporting requirements provide new information to the private (i.e., bank loan) debt market.



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## APPENDIX A

### Data Sources for Test Variables

- Yield* = the mean YTM for all TRACE-reported trades in a firm's debt issues over a specified time period. Data Source: WRDS TRACE data;
- Spread* = the mean credit spread for all TRACE-reported trades in a firm's debt issues over a specified time period. We measure the credit spread for each trade as YTM on the relevant debt issue minus YTM on a matched-by-maturity Treasury security. Data Sources: WRDS TRACE data and Treasury yield data;
- MW* = 1 if a firm reports a material weakness in an initial Section 404 report, and 0 if it does not report a material weakness in an initial Section 404 report. Data Source: Audit Analytics;
- Rated* = 1 if a firm's debt is rated by S&P and/or Moody's, and 0 otherwise. Data Sources: Compustat (S&P rating) and Mergent Bond Record (Moody's rating);
- Bank* = 1 if a firm has a new or revised bank loan agreement in any year from 1988 to 2005, and 0 otherwise. Data Source: DealScan;
- DefaultRisk* = the score from the bankruptcy model of Ohlson (1980). Higher values of *DefaultRisk* indicate a higher probability of default risk. Data Source: Compustat;
- Size* = the log of total assets. Data Source: Compustat;
- CFO* = cash flow from operations scaled by total assets. Data Source: Compustat;
- Leverage* = long-term debt scaled by total assets. Data Source: Compustat;

*CFVol* = the standard deviation over the last 20 quarters of cash flow from operations scaled by total assets. Data Source: Compustat;

*TrsYTM* = the mean of all “YTM on a matched-by-maturity Treasury security” used to calculate a firm’s *Spread* over a specified time period. Data Source: Treasury yield data; and

*Restructure (WriteDown; M&A; Restate)* = an indicator variable equal to 1 if restructuring (writedown; M&A; restatement) activity occurs in a given period, and 0 otherwise. Data Sources: Compustat and Audit Analytics.