

# The Failure to Remediate Previously Disclosed Material Weaknesses in Internal Controls

Jacqueline S. Hammersley, Linda A. Myers, and Jian Zhou

**SUMMARY:** In this paper, we study a sample of companies that fail to remediate previously disclosed material weaknesses (MWs) in their internal control systems and, thus, disclose *the same* MWs in two consecutive annual reports. Their failure to remediate is surprising given that regulators, credit rating agencies, and academics contend that the remediation of MWs is important. We form a control sample of companies that initially disclosed MWs in their internal control systems, but subsequently remediated these weaknesses, and investigate the characteristics of the remediated and unremediated MWs, the characteristics of remediating versus non-remediating companies, and the consequences to non-remediating companies.

Regarding the characteristics of companies failing to remediate, we find that companies are less likely to remediate previously disclosed MWs when the weaknesses are more pervasive (i.e., when they are described as at the entity level, when there are more individual weaknesses) and when their operations are more complex (i.e., they have more segments and have foreign operations). In addition, companies with smaller audit committees are less likely to remediate.

Regarding the consequences, we find that companies failing to remediate MWs experience larger increases in audit fees and a higher likelihood of auditor resignation as the number of MWs increases. We also find that non-remediating companies are more likely to receive modified audit opinions and going-concern opinions. Finally, we find that companies failing to remediate are more likely to miss filing deadlines and experience increased cost of debt capital (i.e., they receive poorer credit ratings when entity level MWs are present, and are charged higher interest rates).

**Keywords:** material weaknesses; internal controls; remediation; Sarbanes-Oxley Act.

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

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## INTRODUCTION

As a consequence of Section 404 of the Sarbanes-Oxley Act of 2002 (SOX), for years ending after November 15, 2004, management of accelerated filers must report their assessment of the design and operating effectiveness of internal controls over financial reporting, and external auditors must provide an audit opinion on the effectiveness of these controls (Securities and Exchange Commission [SEC] 2004).<sup>1</sup> Approximately 15.8 percent of accelerated filers received adverse audit opinions on the effectiveness of their internal controls in the first reporting cycle following the effective date of Section 404 (Olson 2006).<sup>2</sup> For simplicity, we refer to this first opinion as the Year 0 opinion. In the second reporting cycle, approximately 9.6 percent of accelerated filers received adverse audit opinions on the effectiveness of their internal controls (Olson 2006). While this is a significant improvement overall, a number of companies reported *the same* material weaknesses (MWs) in both years; that is, despite there being significant costs to initially reporting internal control weaknesses,<sup>3</sup> a number of companies failed to remediate previously disclosed MWs. In this paper, we examine the characteristics of companies that fail to remediate previously disclosed MWs, as well as the consequences of failing to remediate these weaknesses.

Regulators and the business press contend that the remediation of internal control weaknesses is important because it improves financial reporting reliability, and they suggest that shareholder confidence in financial results will be lower when internal control weaknesses are present (Nicolaisen 2004; Niemeier 2004; Countryman 2005; Pickard 2005; Sinnett 2005). Moreover, creditors use internal control weakness information to price and allocate capital (Jonas 2007), and the business press suggests that private company access to funds and relationships with investors and suppliers are affected by internal control weaknesses (see Badal and Dvorak 2006). Academics agree that remediation is important, and suggest that it should improve investor confidence by signaling that financial statements are more reliable (Ashbaugh-Skaife et al. 2007). In addition, international accounting regulators contend that remediation and disclosures about management's remediation plans are important (Goodfellow and Willis 2007).

Interestingly, there are no *regulatory* consequences for reporting a material weakness or for failing to remediate a known weakness. Rather, companies satisfy the SEC filing requirements by having their internal control systems audited, regardless of the outcome. Additionally, stock exchanges do not delist companies for reporting or for failing to remediate MWs.<sup>4</sup> Given the lack of regulatory consequences for not remediating known MWs, it is important to determine whether other consequences to non-remediation of previously disclosed MWs exist. Moreover,

<sup>1</sup> Accelerated filers are companies with a public float greater than \$75 million, among other requirements.

<sup>2</sup> The options for internal control opinions are: (1) adverse, where at least one material weakness is present, (2) unqualified, where no MWs are present, and (3) disclaimer, where the auditor could not issue an opinion. Thus, internal control audit opinions are not affected by the presence of significant deficiencies or control deficiencies, which are less serious deficiencies in the internal control system.

<sup>3</sup> Previously documented consequences of *initially reporting* internal control weaknesses include a loss of market value (Hammersley et al. 2008), as well as higher audit fees (Hogan and Wilkins 2008), chief financial officer turnover (Li et al. 2010), auditor dismissals (Ettredge et al. 2011), and financial reporting lags (Ettredge et al. 2006). In addition, Ashbaugh-Skaife et al. (2009) find a higher cost of equity (although Ogneva et al. [2007] question these findings) and Beneish et al. (2008) find a higher cost of equity for filers under Section 302, but not under Section 404. In many cases, the consequences are more severe for MWs than for significant deficiencies and control weaknesses.

<sup>4</sup> In contrast, the SEC deems companies that receive disclaimers, qualified opinions, or adverse opinions on the financial statement audit not to have met their filing requirements, and stock exchanges can delist such companies, creating significant and explicit incentives to avoid and to remedy conditions giving rise to such opinions.

understanding the conditions under which companies fail to remediate previously disclosed MWs is important, but this question is largely unexplored.

We examine material weakness disclosures to determine what types of MWs are most likely to be unremediated. We find that companies that fail to remediate report a lower proportion of account-level weaknesses, a higher proportion of entity-level weaknesses (including those that are red flags for fraud), and are more likely to report that their personnel lack technical accounting competence than are companies that remediate. To determine the factors associated with the failure to remediate and to understand the consequences of non-remediation, we identify companies reporting unremediated previously disclosed MWs and contrast these with companies remediating previously disclosed MWs. Specifically, we identify a sample of companies reporting MWs in a given year (Year 0) and reporting *the same* MWs in the following year (Year 1), and compare these with a control sample of companies reporting MWs in a given year (Year 0), but not reporting MWs in the following year. Because our sample and control groups are both comprised of companies that reported MWs in Year 0, we can identify factors associated with the failure to remediate, as well as the consequences of non-remediation which are *over and above* the consequences and factors associated with initially reporting the existence of a material weakness.

With respect to the determinants of non-remediation, we find that companies are more likely to fail to remediate previously disclosed MWs when weaknesses are more pervasive (i.e., at the entity level or when there are more individual weaknesses) and when operations are more complex (i.e., when they have more segments or foreign operations or experience an increase in the number of segments). In addition, we find that companies with smaller audit committees are more likely to fail to remediate.

With respect to consequences, we find that companies suffer adverse consequences for non-remediation of previously disclosed MWs. Specifically, audit fees and the likelihood of auditor resignation increase with the number of MWs for non-remediating companies. In addition, non-remediators are more likely to receive modified audit opinions and going-concern audit opinions, and are more likely to miss filing deadlines. We also find that non-remediating companies experience greater increases in credit ratings in the presence of entity-level weaknesses, suggesting a decrease in perceived creditworthiness and increased interest costs, but we find no evidence of negative stock price reactions to non-remediation.

Our study contributes to the literature by demonstrating that the failure to remediate previously disclosed MWs has negative consequences, despite the lack of explicit regulatory consequences. Because Section 404 of SOX remains controversial and continues to be evaluated (SEC 2011), examining the factors associated with the failure to remediate, as well as the consequences of non-remediation, is timely and important. As such, our study should be of interest to regulators, investors, and other financial statement users who presumably rely on good-quality financial reporting, as well as to managers when doing cost-benefit analyses on the potential remediation of newly identified MWs.

The remainder of the paper is organized as follows. In the next section, we provide background on the reporting and remediation of internal control weaknesses. The following section develops our hypotheses related to the determinants and consequences of non-remediation. Following that, we describe our data and present our empirical findings. The final section concludes.

## INSTITUTIONAL BACKGROUND ON THE REPORTING AND REMEDIATION OF INTERNAL CONTROL WEAKNESSES

According to Auditing Standard No. 5, effective internal control systems should lead to more reliable financial statements (Public Company Accounting Oversight Board [PCAOB] 2007). Auditors issue adverse audit opinions on internal controls, indicating that controls are

ineffective, when even a single material weakness exists. The auditing standards define three categories of internal control weaknesses, in increasing order of severity: control deficiencies, significant deficiencies, and material weaknesses. A material weakness is “a deficiency, or a combination of deficiencies, in internal control over financial reporting, such that there is a reasonable possibility that a material misstatement of the company’s annual or interim financial statements will not be prevented or detected on a timely basis” (PCAOB 2007, Appendix ¶A7).

The early literature on internal control weaknesses focuses on disclosures made under Section 302 of SOX, which requires management to evaluate the effectiveness of internal controls on a quarterly basis, but does not require an audit of the effectiveness of the internal control system. This literature investigates the characteristics of companies *initially reporting* control weaknesses of any type, and finds that they have more complex operations, recent changes in organizational structure, more accounting risk exposure, and fewer resources (Ashbaugh-Skaife et al. 2007). Moreover, prior literature finds that companies *initially reporting* MWs are more complex, smaller, and less profitable than are companies not reporting MWs (Ge and McVay 2005), and that they are younger, growing rapidly, or undergoing restructuring (Doyle et al. 2007a).

With respect to the consequences of *initially reporting* internal control weaknesses, Hogan and Wilkins (2008) and Hoitash et al. (2008) find that audit fees are higher for companies with internal control weaknesses, and that audit fees increase with the severity of the weaknesses. Ettredge et al. (2011) find that companies initially reporting MWs are more likely to dismiss their auditors, and Ettredge et al. (2006) find that they experience longer audit delays, and that these delays are even longer for companies with entity-level weaknesses. While a number of papers study the effects of *initially reporting* internal control weaknesses, few study the characteristics of, or consequences to, companies that *fail to remediate* previously disclosed weaknesses.<sup>5</sup>

The few papers that do examine determinants and consequences of remediation address the implications of *remediation*, while our focus is on the *failure to remediate*. As such, these studies compare companies that report MWs in Year 0 and no MWs in Year 1 (i.e., remediators) to companies that report some MWs in both Year 0 and Year 1. The companies in their non-remediator samples are not necessarily non-remediators in the sense of our paper, because they could be reporting *different* MWs in Year 0 and Year 1. Because we are interested in examining the determinants and consequences associated with the *failure to remediate*, this distinction is important, and our sample selection methodology (which selects only companies reporting *the same* MWs in Year 0 and Year 1) allows us to perform strong tests of the determinants and consequences associated with the failure to remediate previously disclosed MWs.

Research to date that examines company characteristics associated with remediation focuses on corporate governance. Goh (2009) finds that companies are more likely to remediate when they have larger audit committees, when these committees have greater nonaccounting financial expertise, and when their boards are more independent.<sup>6</sup> Li et al. (2010) and Johnstone et al. (2011) also address the determinants of the failure to remediate, but focus on the role of the Chief Financial Officer (CFO) or other governance mechanisms. Li et al. (2010) report that companies with weaker CFOs are more likely to initially report a material weakness, and that those which hire better-qualified CFOs are more likely to remediate MWs. Johnstone et al. (2011) report that

<sup>5</sup> Bedard and Graham (2010) investigate companies’ failure to remediate deficiencies in the year in which they are discovered, but do not address the failure to remediate previously disclosed weaknesses. Similarly, Charles River Associates (2005) focuses on remediation in the year of discovery.

<sup>6</sup> Interestingly, Zhang et al. (2007) find that companies are more likely to disclose internal control weaknesses if their audit committees have less financial expertise.

companies hiring new CFOs who are Certified Public Accountants, who have public accounting experience, or who are more experienced are more likely to remediate.<sup>7</sup>

With respect to remediation consequences, remediating companies experience improved accrual quality (Ashbaugh-Skaife et al. 2008) and a significant decline in the cost of equity capital (Ashbaugh-Skaife et al. 2009). In addition, Munsif et al. (2011) report that audit fees decline when accelerated filers remediate material weaknesses, but Bedard et al. (2008) find no effect on the audit fees of non-accelerated filers when internal control weaknesses reported under Section 302 are remediated. Thus, although some papers study specific consequences of remediation, very little is known about the consequences of *non*-remediation of previously disclosed MWs.

## DEVELOPMENT OF HYPOTHESES

### Characteristics of Companies Failing to Remediate Previously Disclosed Material Weaknesses

Because prior literature documents significant costs to initially reporting MWs and suggests benefits to remediation, we posit that managers will remediate MWs wherever possible, unless the expected remediation costs exceed the expected remediation benefits. Thus, we investigate situations where expected remediation costs should be relatively high—when previously disclosed MWs are more pervasive, and when business operations are complex or companies are more likely to lack the financial resources necessary to successfully remediate.

#### *Pervasiveness of the Previously Disclosed Material Weaknesses*

We consider two measures of the pervasiveness of previously disclosed MWs: (1) whether the weaknesses are at the entity level, and (2) the number of MWs. We hand collect this information from the initial disclosures.

1. Entity-level weaknesses: Entity-level weaknesses relate to the overall control environment and are much more serious than other weaknesses. They include weaknesses in one or more of the five components of the control framework established by the Committee of Sponsoring Organizations (COSO); these components include the control environment, risk assessment, control activities, information and communication, and monitoring (COSO 1994).<sup>8</sup> These weaknesses may raise concerns about management's ability to run the business and to prepare accurate financial statements (Doss and Jonas 2004). Li et al. (2010) find no relation between the presence of entity-level weaknesses and the likelihood that MWs are remediated, but Johnstone et al. (2011) find that the presence of entity-level weaknesses predicts whether some, but not all, types of MWs will be remediated. We posit that the presence of entity-level weaknesses will increase the likelihood that companies will

<sup>7</sup> Johnstone et al. (2011) also find that remediation is less likely for companies reporting losses, companies that are highly leveraged, companies with more segments, and companies that are restructuring.

<sup>8</sup> Entity-level MWs can affect multiple components. For example, in its Form 10-K filed September 30, 2005, Fedders Corp. reports, "The Company's *control environment did not sufficiently promote effective internal control over financial reporting* throughout its management structure, and this material weakness was a contributing factor in the development of other MWs described below. Principal contributing factors included the turnover of employees in key financial reporting positions, the lack of a formal program for training members of the Company's finance and accounting groups, a lack of a full evaluation of the Company's financial system applications due to incomplete documentation and testing of key controls, and the lack of a complete entity-wide risk assessment. This deficient control environment also contributed to the Company's inability to complete its documentation of controls by the as of date of December 31, 2004, and to complete its assessment of design effectiveness, general computer controls, financial system application controls, and tax controls" (Fedders Corp. 2005; emphasis added).

fail to remediate all of their MWs, since the effects of these weaknesses are systemic and their remediation requires more resources.

2. Number of material weaknesses: The greater the number of individual MWs, the greater the effort and resources that should be required to remediate, all else equal. Thus, we posit that the greater the number of MWs, the more likely they will fail to be remediated.

### ***Complexity and Access to Resources***

Because prior research finds that companies *initially reporting* MWs are more complex and have less access to resources (Ge and McVay 2005), we posit that more complex companies and those with less access to resources will be more likely to fail to remediate. With respect to complexity, we consider the number of segments, whether the company has foreign operations, whether it has undergone a merger or acquisition, or has restructured, as well as company growth. With respect to access to resources, we consider company size and the presence of prior losses.

### **Consequences of Failing to Remediate Previously Disclosed Material Weaknesses**

Because the continued existence of MWs raises concerns about financial statement reliability and/or indicates management's inability or unwillingness to remediate these weaknesses, we expect companies not remediating previously disclosed weaknesses to face negative consequences. The costs could be implicit or explicit.

### ***Audit Fees***

Assuming that the risk/return trade-off is acceptable, auditors price audit engagements to compensate for the overall level of risk (Johnstone and Bedard 2003). Because the presence of a material weakness indicates an increased likelihood of material misstatement, auditors of companies with unremediated MWs must do additional substantive testing. Consistent with this, using pre-SOX data, Bedard and Johnstone (2004) find that planned audit hours and hourly billing rates are significantly higher for clients with significant internal control weaknesses. Audit fees also increase in auditor litigation risk (Seetharaman et al. 2002), and because companies reporting internal control weaknesses have higher idiosyncratic risk (Ashbaugh-Skaife et al. 2009), we expect auditors of non-remediating companies to experience even greater exposure to litigation risk and to price their audits accordingly. Surprisingly, Bedard et al. (2008) find that non-accelerated filers reporting internal control weaknesses in consecutive years under Section 302 do not pay higher audit fees in the later year than in the former year, but non-accelerated filers that remediate internal control weaknesses enjoy a reduction in audit fees. We expect non-remediating companies to experience greater increases in audit fees than comparable remediating companies because their auditors must do additional, more costly substantive testing to support their financial statement opinions in the presence of continuing MWs.

### ***Audit Opinions***

Prior literature finds that modified opinions are more likely for companies with high litigation risk (Krishnan and Krishnan 1996) and for companies most likely to fail *ex ante* (Blacconiere and DeFond 1997). These characteristics are also associated with companies that report MWs, and are even more likely to be present when companies fail to remediate previously disclosed MWs. Elder et al. (2009) report that auditors are more likely to issue modified audit opinions to companies that report initial MWs because of increased control risk. Additionally, to the extent that unremediated MWs increase auditor concern about management's commitment to effective internal controls, financial reporting, and integrity, non-remediation may result in a higher likelihood of modified audit opinions. Thus, we expect non-remediating companies to be more likely to receive modified

audit opinions than companies that remediate, because auditors will respond to the higher risk present on these engagements. Similarly, we expect non-remediating companies to be more likely to receive going-concern opinions because non-remediation may result from resource constraints.

### **Auditor Resignations**

[Johnstone and Bedard \(2003\)](#) suggest that error, fraud, and client business risks affect auditors' client retention decisions, and [Krishnan and Krishnan \(1997\)](#) and [Shu \(2000\)](#) find that auditor resignations increase in litigation risk. The implementation of SOX provisions increased the demand for audit firm personnel who were already in short supply (United States Government Accountability Office [[USGAO 2006](#)]; [Stuart 2006](#)), and Big 4 firms were disproportionately affected because large clients, who make up a large proportion of their client base, were required to adopt the audit provision of Section 404 ([USGAO 2006](#)). Consequently, we expect auditors to be more likely to resign from time-consuming, less-compliant clients who may increase their client portfolio risk.<sup>9</sup> Thus, we suggest that auditors will be more likely to resign from clients that do not remediate previously disclosed MWs.

### **Late Filing**

Prior research suggests that the audit report lag is also longer for companies receiving qualified financial statement opinions ([Whittred 1980](#); [Bamber et al. 1993](#)) and when financial performance is poor ([Ashton et al. 1987](#); [Bamber et al. 1993](#); [Schwartz and Soo 1996](#)). In addition, the audit report lag increases with audit complexity and risk ([Hay et al. 2005](#)), presumably because complex and risky clients are more difficult and time-consuming to audit ([Simunic 1980](#); [Hackenbrack and Knechel 1997](#); [Hay et al. 2005](#)). Thus, we expect the audit delay to be longer for non-remediating companies.

### **Credit Market Effects**

Credit rating agencies, like Moody's Investors Service, explicitly consider management's remediation plans and the failure to remediate MWs when deciding whether to reduce credit ratings ([Jonas 2005, 2006](#)). In fact, failure to remediate is one of three factors considered in the decision to take negative rating action,<sup>10</sup> and Moody's reduced the credit ratings of approximately 20 percent of the companies that reported control problems in the first reporting cycle under Section 404 ([Jonas 2006](#)). Indeed, [Dhaliwal et al. \(2011\)](#) find that companies initially reporting MWs experience ratings downgrades, on average. Non-remediation should also lead to an increase in the cost of debt capital because of concerns about financial reporting credibility. Thus, we expect non-remediating companies to experience decreased credit ratings and higher interest rates.

### **Equity Market Effects**

[Beneish et al. \(2008\)](#) and [Hammersley et al. \(2008\)](#) find that companies initially reporting MWs under Section 302 experience negative stock price reactions.<sup>11</sup> Given this, we expect non-remediating companies to also experience negative stock price reactions.

<sup>9</sup> Consistent with this, the business press reports more auditor changes when companies initially report internal control weaknesses (see, for example, [Taub 2005](#)).

<sup>10</sup> The other two factors include whether the weakness is classified by Moody's as "pervasive" (i.e., an entity-level weakness), and whether the company's rating already reflects significant uncertainty related to financial reporting.

<sup>11</sup> Note, however, that [Beneish et al. \(2008\)](#) do not find negative stock price reactions for companies receiving initial adverse auditor opinions on internal controls under Section 404.

## DATA AND EMPIRICAL MODELS

### Sample Selection

Table 1, Panel A describes our sample selection procedure. To obtain a sample of companies that did not remediate previously disclosed MWs, we start with data from Audit Analytics and identify all companies reporting weaknesses in the first reporting cycle (Year 0). Specifically, we start with 6,966 unique company observations available from Audit Analytics as of June 2006, and exclude four observations without internal control information. Our design requires companies to report two consecutive years (Years 0 and 1) of internal control information under Section 404,<sup>12</sup> leaving 2,798 unique company observations. Of these, 368 report MWs in Year 0, but 84 of these do not have the necessary data in Compustat or I/B/E/S and are excluded from our sample. We read the material weakness disclosures in Years 0 and 1 for the remaining 284 companies to determine whether they remediated their previously disclosed Year 0 weaknesses by the end of Year 1. Since 29 of these companies report *different* MWs in Year 0 and Year 1 and are not clearly remediators or non-remediators, we exclude them from our analyses. Of the remaining 255 companies, 55 report at least one material weakness in Year 1 that is identical to a weakness reported in Year 0; these are our sample companies. The other 200 companies do not report MWs in Year 1; these are our control companies.

### Longevity of Unremediated Material Weaknesses

To better understand the lifespan of non-remediated MWs, we trace the disclosure of these weaknesses back to the original reporting year and forward to their remediation. Tracing back, we find that sample and control companies reported very few MWs prior to the implementation of Section 404. Indeed, only four of the 55 non-remediating companies reported MWs in Year -1, and only ten of the 200 remediating companies reported MWs in Year -1. In addition, of the 116 unremediated MWs in our study, only eight were reported in Year -1, and only three were reported in Year -2.<sup>13</sup> This suggests that the audit provisions of Section 404 act as a disciplining mechanism for internal control reporting. Of the 234 MWs reported by sample companies in Year 0, 116 (from 55 companies) remained in Year 1, 37 (from 19 companies) remained in Year 2, eight (from five companies) remained in Year 3, and one remained in Year 4 and Year 5. Of the 14 entity-level weaknesses reported in Year 0, none were reported prior to Year 0, and six (from six companies) remained in Year 1, four (from four companies) remained in Year 2, one remained in Year 3, and all were remediated in Year 4.

### Content of the Material Weakness Disclosures

To better understand the causes of non-remediation, we read and coded the content of all initial and subsequent material weakness disclosures made by our non-remediating companies for information disclosed about remediation plans and the types of MWs. Interestingly, 90.9 percent of non-remediating companies announced an intention to remediate. The remainder were silent about their remediation plans, and none stated that they did not plan to remediate.<sup>14</sup>

<sup>12</sup> We limit sample (and control) companies to those reporting MWs under Section 404, and do not consider MWs reported under Section 302 because of important differences in reporting requirements. First, Section 302 does not require independent audits of internal controls over financial reporting. Second, public disclosure of weaknesses was not required prior to the first disclosure under Section 404, making Section 302 disclosures voluntary in nature.

<sup>13</sup> Non-remediating companies reported 234 MWs in Year 0, but only 13 in Year -1 and three in Year -2.

<sup>14</sup> For example, Biolase Technology's 10-Q filed on November 9, 2005, states, "[d]ue to the delayed filing of our Form 10-K for the fiscal year ended December 31, 2004 and Forms 10-Q/A for the three quarters therein, and the Forms 10-Q for the first and second fiscal quarters of 2005, we have not implemented any additional Remedial Measures described in the Management's Report on Internal Control Over Financial Reporting contained in Item 9A of our Annual Report on Form 10-K for the fiscal year ended December 31, 2004. *Management intends to implement these measures during the course of 2005 and 2006*" (Biolase Technology 2005; emphasis added).



**TABLE 1**  
**Sample Selection and Remediation Status**

**Panel A: Sample Selection**

Number of unique company observations from Audit Analytics as of June 2006	6,966
Less:	
Companies without internal control disclosures	(4)
Companies without consecutive internal control disclosure	(4,164)
Companies with unqualified Year 0 internal control opinions	(2,430)
Companies reporting a material weakness in Year 0	368
Companies missing Compustat or I/B/E/S data	(84)
Companies reporting different MWs in Years 0 and 1	(29)
Companies eligible for inclusion in the sample or control groups	<u>255</u>
Companies remediating previously disclosed MWs (the control group)	<u>200</u>
Companies with unremediated previously disclosed MWs (the sample group)	<u>55</u>

**Panel B: Remediation Status of Material Weaknesses, by Type Disclosed in Year 0**

	% of Control Company Weaknesses (n = 372)	% of Sample Company Weaknesses (n = 234)	% of Sample Company Weaknesses	
			Unremediated in Year 1 (n = 116)	Remediated in Year 1 (n = 118)
A. Total transaction accounting weaknesses	53.3	47.0	42.1	51.7
Revenue recognition	9.2	8.6	12.1	5.1
Expense recognition	1.6	2.1	0.0	4.2
Accounts receivable	0.5	0.8	0.0	1.7
Tax accounting	10.2	12.0	18.1	5.9
Inventory accounting	5.1	3.8	1.7	5.9
Consolidation	0.0	1.7	1.7	1.7
Fixed assets	3.0	1.3	0.0	2.5
Stock-based compensation	0.8	0.0	0.0	0.0
Fair value accounting	0.3	0.4	0.0	0.8
Foreign currency	0.5	1.7	1.7	1.7
Goodwill	0.8	0.8	0.0	1.7
Patents and other intangibles	0.5	0.4	0.0	0.8
Software development	0.8	0.8	0.0	1.7
Accruals	2.2	2.1	1.7	2.5
Minority interest	0.5	0.5	0.0	0.9
Deferred revenue	0.8	0.5	0.0	0.9
Earnings per share	0.3	0.0	0.0	0.0
Accounts payable	0.8	0.0	0.0	0.0
Payroll	0.0	1.3	0.8	1.7
Subsidiaries and related parties	0.3	1.7	1.7	1.7
Oil and gas reserves	0.3	0.0	0.0	0.0
Loans	0.3	0.0	0.0	0.0
Leases	11.0	2.1	0.9	3.4

(continued on next page)

TABLE 1 (continued)

	% of Control Company Weaknesses (n = 372)	% of Sample Company Weaknesses (n = 234)	% of Sample Company Weaknesses	
			Unremediated in Year 1 (n = 116)	Remediated in Year 1 (n = 118)
Cash	1.6	1.3	0.0	2.5
Stock issuance	0.0	0.5	0.0	0.9
Pension	0.3	0.8	0.0	1.7
Derivatives	0.8	0.8	1.7	0.0
Insurance contracts	0.8	0.5	0.0	0.9
Operations	0.0	0.5	0.0	0.9
B. Total control system weaknesses	24.7	24.4	23.5	25.4
Inadequate or lack of timely review	6.7	4.3	4.3	4.2
Incomplete account analysis	0.2	0.5	0.9	0.0
Untimely preparation of account reconciliations	2.4	3.4	2.6	4.2
Inadequate controls over non-routine transactions	3.8	2.6	0.9	4.2
Lack of discipline around financial reporting	0.0	0.8	0.9	0.9
Approval procedures not followed	0.8	2.1	0.9	3.4
Other procedures not followed	1.1	0.0	0.0	0.0
Inadequate general computer controls	0.5	2.6	2.6	2.5
Poor segregation of duties	3.8	4.3	4.3	4.2
Inadequate access security	2.4	1.7	2.6	0.9
Other IT weaknesses	0.3	0.5	0.9	0.0
Lack of documentation of control procedures	1.4	0.0	0.0	0.0
Multiple systems or platforms are in use, increasing complexity	0.3	0.0	0.0	0.0
Use of and lack of control over spreadsheets	0.5	0.8	0.9	0.9
Use of and lack of control over manual systems	0.5	0.8	1.7	0.0
C. Total personnel weaknesses	11.0	12.4	18.1	6.8
Lack of technical competence with FAS or SEC filing requirements	7.5	10.3	16.4	4.2
Lack of qualified corporate governance	0.3	0.0	0.0	0.0
Inadequate training	0.5	0.4	0.0	0.9
Staffing limitations at lower levels	0.3	0.0	0.0	0.0
Lack of internal audit function or other monitoring	2.4	1.7	1.7	1.7
D. Total control environment weaknesses	5.6	9.8	9.4	10.2
Lack of key personnel	0.3	0.0	0.0	0.0
Evidence of management override of controls or integrity issues	0.3	0.0	0.0	0.0

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TABLE 1 (continued)

	% of Control Company Weaknesses (n = 372)	% of Sample Company Weaknesses (n = 234)	% of Sample Company Weaknesses	
			Unremediated in Year 1 (n = 116)	Remediated in Year 1 (n = 118)
Internal control weaknesses that are red flags for fraud or that allowed fraud to occur	0.2	6.0	4.3	7.6
Insufficient documentation or policies to support transactions or adjusting entries	4.0	1.7	1.7	1.7
Inadequate lines of communication between management and accounting staff and/or auditors that prevent transactions from being recorded correctly	0.8	2.1	3.4	0.9
E. Total problems with financial statement closing procedures	5.4	6.4	6.9	5.9

We also coded disclosures about planned changes. Fifty companies reported an intention to implement more than one change, for a total of 172 planned changes. We categorized planned changes as changes to accounting personnel, changes to internal control systems, and various other changes. Planned changes to accounting personnel include plans to terminate accounting personnel (eight instances), to hire additional accounting personnel (37), and to train personnel who work in the area of the weaknesses (24). Planned changes to internal control systems include improvements to control processes (41) and the implementation of new internal control systems (15). Various other changes include plans to change the organizational chart (five), to improve corporate governance (ten), and to create or bolster the internal audit department (nine). Finally, 21 companies planned to hire consultants to assess their control systems or remediate the weaknesses, and two planned improvements only in the area of the weakness.

In Table 1, Panel B we report the types of Year 0 MWs for both non-remediating (sample) and remediating (control) companies. We also report on the status of the sample companies' Year 0 MWs at the end of Year 1. The control group (200 companies) reported 372 MWs in Year 0, and all are remediated in Year 1. In contrast, the sample group (55 companies) reported 234 MWs in Year 0, and only 118 (49.6 percent) are remediated in Year 1. We note three items of interest. First, 53.3 percent of control companies' MWs were transaction accounting weaknesses, versus 47.0 percent for sample companies, suggesting that the control sample identified more MWs that affected a single accounting process, which likely made them easier to remediate. Within this category, 11.0 (2.1) percent of control (sample) company weaknesses related to leases. Ignoring leases, MWs related to tax accounting and revenue recognition were most common for both control and sample companies. Second, sample companies reported a higher proportion of control environment weaknesses (9.8 percent versus 5.6 percent for control companies). In addition, 6.0 percent of sample company MWs were red flags for fraud or had allowed fraud to occur, compared to only 0.2 percent for control companies. Third, while sample and control companies reported similar levels of personnel weaknesses (12.4 versus 11.0 percent, respectively), sample companies were more likely to report that their personnel lacked technical competence with Financial Accounting Standards (FAS) or SEC filing requirements (10.3 versus 7.5 percent, respectively).

**TABLE 2**  
**Variable Definitions**

**Panel A: Definitions for Determinants Models**

Variable	Definition
<i>ACEXP</i>	= the number of audit committee members designated as financial experts in Year 0;
<i>ACSZ</i>	= audit committee size, measured as the number of audit committee members in Year 0;
<i>BIG4</i>	= an indicator variable equal to 1 if the company is audited by a Big 4 auditor in Year 0, and 0 otherwise;
<i>CEO_CHANGE</i>	= an indicator variable equal to 1 if there is a CEO change between Years 0 and 1, and 0 otherwise;
<i>CFO_CHANGE</i>	= an indicator variable equal to 1 if there is a CFO change between Years 0 and 1, and 0 otherwise;
<i>CHG(ACEXP)</i>	= the change in <i>ACEXP</i> from Year -1 to Year 0;
<i>CHG(ACSZ)</i>	= the change in <i>ACSZ</i> from Year -1 to Year 0;
<i>CHG(BIG4)</i>	= the change in <i>BIG4</i> from Year -1 to Year 0;
<i>CHG(FOREIGN)</i>	= the change in <i>FOREIGN</i> from Year -1 to Year 0;
<i>CHG(GROWTH)</i>	= the change in <i>GROWTH</i> from Year -1 to Year 0;
<i>CHG(INSTI)</i>	= the change in <i>INSTI</i> from Year -1 to Year 0;
<i>CHG(INVENTORY)</i>	= the change in <i>INVENTORY</i> from Year -1 to Year 0;
<i>CHG(LOSS)</i>	= the change in <i>LOSS</i> from Year -1 to Year 0;
<i>CHG(M&amp;A)</i>	= the change in <i>M&amp;A</i> from Year -1 to Year 0;
<i>CHG(NUMEST)</i>	= the change in <i>NUMEST</i> from Year -1 to Year 0;
<i>CHG(RESTATEMENT)</i>	= the change in <i>RESTATEMENT</i> from Year -1 to Year 0;
<i>CHG(RESTRICTURE)</i>	= the change in <i>RESTRICTURE</i> from Year -1 to Year 0;
<i>CHG(SEGMENTS)</i>	= the change in <i>SEGMENTS</i> from Year -1 to Year 0;
<i>CHG(SIZE)</i>	= the change in <i>SIZE</i> from Year -1 to Year 0;
<i>CHG(STD_OCF)</i>	= the change in <i>STD_OCF</i> from Year -1 to Year 0;
<i>CHG(ZSCORE)</i>	= the change in <i>ZSCORE</i> from Year -1 to Year 0;
<i>ENTITY_LEVEL_MW</i>	= an indicator variable equal to 1 if the company described a material weakness as at the entity level in Year 0, and 0 if none of the MWs were described as at the entity level;
<i>FOREIGN</i>	= an indicator variable equal to 1 if the company reports non-zero foreign currency translation (data item #150) in Year 0, and 0 otherwise (see <a href="#">Doyle et al. 2007b</a> );
<i>GROWTH</i>	= the three-year average sales growth for Years -2 through 0;
<i>INSTI</i>	= the proportion of company stock held by institutional owners in Year 0;
<i>INVENTORY</i>	= the three-year average ratio of inventory to sales for Years -2 through 0;
<i>LITIGATION</i>	= an indicator variable equal to 1 if a company is in a litigious industry (defined as those with SIC codes 2833 through 2836, 3570 through 3577, 3600 through 3674, 5200 through 5961, and 7370), and 0 otherwise (see <a href="#">Ashbaugh-Skaife et al. 2007</a> );
<i>LOSS</i>	= the percentage of loss years in Years -3 through 0;
<i>M&amp;A</i>	= an indicator variable equal to 1 if a company is involved in a merger or acquisition from Year -2 through Year 0, and 0 otherwise (Compustat AFNT #1) (see <a href="#">Ashbaugh-Skaife et al. 2007</a> );
<i>NUM_MW</i>	= the number of MWs reported in Year 0;
<i>NUMEST</i>	= the number of analysts following the company in Year 0;

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TABLE 2 (continued)

Variable	Definition
<i>RESTATEMENT</i>	= an indicator variable equal to 1 if the company restated its financial statement in Years -2 through 0, and 0 otherwise;
<i>RESTRUCTURE</i>	= an indicator variable equal to 1 if a company was involved in a restructuring from Year -2 through Year 0, and 0 otherwise (as in <a href="#">Ashbaugh-Skaife et al. [2007]</a> , this variable is coded 1 if any of the following Compustat data items are non-zero: 376, 377, 378 or 379);
<i>SEGMENTS</i>	= the number of business segments in Year 0;
<i>SIZE</i>	= the three-year average of the natural log of the market value of equity for Years -2 through 0;
<i>STD_OCF</i>	= the standard deviation of operating cash flow deflated by total assets over the six-year period ending with Year 0; and
<i>ZSCORE</i>	= Altman's Z-score in Year 0.

## Panel B: Definitions for Consequences Models

Variable	Definition
<i>AUDIT_FEE</i>	= audit fees, in dollars, during Year 1;
<i>BIG4</i>	= an indicator variable equal to 1 if the company is audited by a Big 4 auditor in Year 1, and 0 otherwise;
<i>CHG(AUDIT_FEE)</i>	= the percent change in audit fees from Year 0 to Year 1;
<i>CHG(BIG4)</i>	= the change in <i>BIG4</i> from Year 0 to Year 1;
<i>CHG(CREDIT_RATING)</i>	= the change in the company's transformed Standard & Poor's senior credit rating (from Year 0 to Year 1, where we follow <a href="#">Jiang [2008]</a> in transforming S&P credit ratings [from Compustat data item 280] to range between 1, representing an AAA credit rating, and 17, representing a credit rating of no greater than CCC+);
<i>CHG(GROWTH)</i>	= the change in <i>GROWTH</i> (defined below) from Year 0 to Year 1;
<i>CHG(INT_RATE)</i>	= the change in the company's interest rate from Year 0 to Year 1, where interest rate is interest expense divided by the average of short- plus long-term debt for the year ( <a href="#">Pittman and Fortin 2004</a> );
<i>CHG(LEVERAGE)</i>	= the change in <i>LEVERAGE</i> from Year 0 to Year 1;
<i>CHG(LOG(AGE))</i>	= the change in <i>LOG(AGE)</i> from Year 0 to Year 1;
<i>CHG(NUMEST)</i>	= the change in <i>NUMEST</i> from Year 0 to Year 1;
<i>CHG(OPINION)</i>	= the change in <i>OPINION</i> from Year 0 to Year 1;
<i>CHG(ROA)</i>	= the change in <i>ROA</i> from Year 0 to Year 1;
<i>CHG(SEGMENTS)</i>	= the change in <i>SEGMENTS</i> from Year 0 to Year 1;
<i>CHG(SIZE)</i>	= the change in <i>SIZE</i> from Year 0 to Year 1;
<i>CHG(STD_OCF)</i>	= the change in <i>STD_OCF</i> from Year 0 to Year 1;
<i>CHG(TENURE)</i>	= the change in <i>TENURE</i> from Year 0 to Year 1;
<i>CHG(ZSCORE)</i>	= the change in <i>ZSCORE</i> from Year 0 to Year 1;
<i>ENTITY_LEVEL_MW</i>	= an indicator variable equal to 1 if the company described a material weakness as at the entity level in Year 0, and 0 if none of the MWs were described as at the entity level;
<i>GCO</i>	= an indicator variable set to 1 if the company received a going-concern audit opinion in Year 1, and 0 otherwise;
<i>GROWTH</i>	= average sales growth between Years 0 and 1, where sales growth is calculated as sales (#12) in Year 1 minus sales in Year 0, divided by sales in Year 0;
<i>LATE FILER</i>	= an indicator variable set to 1 if the company was late in filing its financial statements in Year 1 (from Audit Analytics), and 0 otherwise;

(continued on next page)

TABLE 2 (continued)

Variable	Definition
<i>LEVERAGE</i>	= company leverage, measured as the ratio of long-term debt (#9) to total assets (#6) in Year 1;
<i>LOG(AGE)</i>	= the natural log of the number of years between the company's initial public offering, as identified by the CRSP, and Year 1, following <a href="#">Mansi et al. (2004)</a> ;
<i>LOG(AUDIT_FEE)</i>	= the natural log of audit fees, in dollars, during Year 1;
<i>LOSS</i>	= percentage of loss years in Years -1 through 1;
<i>MILLS</i>	= the inverse Mills ratio from Model (1);
<i>NEWMW</i>	= an indicator variable equal to 1 if the company reports a new material weakness in Year 1, and 0 otherwise;
<i>NON-REMIATOR</i>	= an indicator variable equal to 1 if a company disclosed a material weakness in Year 0 and disclosed the same material weakness in Year 1, and equal to 0 if a company disclosed a material weakness in Year 0, but remediated that weakness during Year 1;
<i>NUM_MW</i>	= the number of MWs reported in Year 0;
<i>NUMEST</i>	= the number of analysts following the company in Year 1;
<i>OPINION</i>	= an indicator variable set to 1 if the company received other than a standard unqualified opinion in Year 1, and 0 otherwise;
<i>RESIGNATION</i>	= an indicator variable set to 1 if the company's auditor resigns in Year 1, and 0 otherwise;
<i>ROA</i>	= return on assets, measured as income before extraordinary items divided by average total assets in Year 1;
<i>SEGMENTS</i>	= the number of business segments in Year 1;
<i>SIZE</i>	= the three-year average of the natural log of the market value of equity for Years -1 through 1;
<i>STD_OCF</i>	= the standard deviation of operating cash flow deflated by total assets over the six-year period ending with Year 1;
<i>TENURE</i>	= auditor tenure, in years, as of Year 1; and
<i>ZSCORE</i>	= Altman's Z-score in Year 1.

When comparing remediated and unremediated MWs for the sample companies, we note two things. First, 42.7 (51.4) percent of unremediated (remediated) weaknesses were transaction accounting weaknesses, reinforcing the notion that these may be relatively easier to remediate. Within this category, revenue recognition and tax accounting weaknesses were most likely to remain unremediated. Second, 18.1 (6.8) percent of unremediated (remediated) weaknesses were personnel weaknesses, and 16.4 (4.2) percent of unremediated (remediated) personnel weaknesses indicated a lack of technical competence with FAS or SEC filing requirements.

### Characteristics of Companies Failing to Remediate Previously Disclosed Material Weaknesses

We test for the determinants of failing to remediate MWs using the logistic regression model in Table 4. All variables are defined in Table 2. As described previously, we expect companies with more pervasive MWs (i.e., MWs at the entity-level or a larger number of MWs) to be more likely to fail to remediate, so we expect the coefficient on the pervasiveness measures to be positive. We expect complexity of operations to be positively associated with non-remediation, and we proxy for complexity using the number of business segments, foreign operations, recent merger or acquisition activity, recent restructuring, and sales growth, as well as changes in these variables. We expect companies with limited resources to be less likely to remediate, and proxy for resources with company size and prior history of losses. Finally, we expect coefficients on CEO and CFO changes

to be negative, because we posit that incoming management will make material weakness remediation a priority given the negative consequences of having MWs. We control for inventory level, risk (using Z-score), prior financial statement restatements, auditor size, whether the company is in a litigious industry, the number of analysts following, the standard deviation of operating cash flows, institutional ownership, audit committee size, and audit committee financial expertise, as well as changes in these variables.

### Consequences of Failing to Remediate Previously Disclosed Material Weaknesses

In Tables 5 through 9, we investigate the consequences of not remediating previously disclosed MWs. The regression models are presented in the tables.<sup>15</sup> We include two proxies for the pervasiveness of internal control problems—an indicator for whether the weakness is at the entity level (*ENTITY\_LEVEL\_MW*), and the number of MWs reported (*NUM\_MW*). In separate models, we interact our pervasiveness proxies (*ENTITY\_LEVEL\_MW* and *NUM\_MW*) and the non-remediation indicator to test whether the consequences are more severe when unremediated weaknesses are more pervasive. When our dependent variables are levels rather than changes (i.e., *OPINION*, *GCO*, *RESIGNATION*, and *LATE\_FILER*), we include the level of the dependent variable in the prior year to capture how non-remediation affects the dependent variable controlling for its prior level. For example, we study the relation between non-remediation and Year 1 audit opinion controlling for the Year 0 audit opinion, etc.

#### Audit Fees

Models (2a) and (2b) investigate the association between changes in audit fees and the failure to remediate previously disclosed MWs. Prior research finds that audit fees are higher for companies initially reporting internal control weaknesses (Raghunandan and Rama 2006; Elder et al. 2009; Hogan and Wilkins 2008). We expect that fees will be even higher when companies fail to remediate (*NON-REMIATOR*) because auditors must perform additional substantive testing to ensure that no material misstatements related to the material weakness remain in the financial statements. We control for leverage (*LEVERAGE*), return on assets (*ROA*), sales growth (*GROWTH*), audit opinion (*OPINION*),<sup>16</sup> company size (*SIZE*), number of business segments (*SEGMENTS*), and auditor size (*BIG4*), since prior literature has shown that these are related to audit fees (see, for example, Simunic 1980; Francis et al. 2005). We also control for changes in these control variables, and we include the inverse Mills ratio (*MILLS*) from the non-remediation determinants model (Model (1c)) to control for the decision to not remediate.<sup>17</sup> Finally, we control for new MWs in Year 1 (*NEWMW*) because we expect these to increase Year 1 audit fees. Our expectations on sign appear in Table 5 and follow prior literature.

#### Audit Opinions

Models (3a) and (3b) investigate the association between audit opinion type and the failure to remediate previously disclosed MWs. Elder et al. (2009) suggest that auditors issue qualified audit

<sup>15</sup> We use ordinary least squares regression for continuous dependent variables, and logistic regression for dichotomous dependent variables.

<sup>16</sup> To form the modified audit opinion indicator, which takes a value of 0 when the client receives a standard unqualified opinion, and a value of 1 when the client receives any other opinion (i.e., an unqualified opinion with explanatory language, a qualified opinion, a disclaimer, or an adverse opinion), we follow Bradshaw et al. (2001).

<sup>17</sup> In the determinants model, we replace missing lagged analyst following and lagged institutional holdings with zeros.

opinions (*OPINION*) to manage the risk related to internal control weaknesses, so we expect that audit opinions will be more likely to be other than unqualified when clients fail to remediate. In Models (3c) and (3d), we investigate the association between going-concern opinions (*GCO*) and the failure to remediate. Again, we control for leverage, return on assets, sales growth, company size, and auditor size, since prior literature finds these to be related to the audit opinion (see, for example, [Butler et al. 2004](#)). We also control for the percentage of losses in the last three years (*LOSS*), the probability of bankruptcy (*ZSCORE*), the inverse Mills ratio from the non-remediation determinants model, and new Year 1 MWs. Our expectations on sign appear in Table 6 and follow prior literature.

### ***Auditor Resignations***

Models (4a) and (4b) investigate the association between auditor resignations (*RESIGNATION*) and the failure to remediate previously disclosed MWs. [Ashbaugh-Skaife et al. \(2007\)](#) and [Elder et al. \(2009\)](#) find that auditors are more likely to resign from clients reporting internal control weaknesses or MWs. Given this, we expect that auditors will be even more likely to resign when clients fail to remediate. Again, we control for leverage, return on assets, sales growth, prior losses, company size, auditor size, and new MWs. We include these because a 2006 Government Accountability Office report suggests that auditor-client realignments are related to audit costs and service, client profitability, and risk concerns ([USGAO 2006](#)). We also control for audit fees and the inverse Mills ratio.

### ***Late Filing***

Models (5a) and (5b) investigate the association between the late filing of financial statements (*LATE FILER*) and the failure to remediate previously disclosed MWs. [Ettredge et al. \(2006\)](#) and [Bryant-Kutcher et al. \(2007\)](#) find a positive relation between MWs and late filing. Given this, we expect that companies will be even more likely to file late when they fail to remediate. Again, we control for leverage, return on assets, sales growth, prior losses, company size, auditor size, the inverse Mills ratio, and new MWs. Additionally, we control for audit opinion and audit fees, since prior literature suggests that the audit report lag increases for companies receiving qualified opinions ([Whittred 1980](#); [Bamber et al. 1993](#)) and with factors that affect audit fees (i.e., audit complexity and risk).

### ***Credit Ratings and Interest Rates***

Models (6a) and (6b) investigate the association between changes in credit ratings (*CHG(CREDIT\_RATING)*) and the failure to remediate previously disclosed MWs, while Models (6c) and (6d) investigate the association between the change in interest rates (*CHG(INT\_RATE)*) and the failure to remediate.<sup>18</sup> Following [Mansi et al. \(2004\)](#), we control for auditor size, auditor tenure (*TENURE*), company age (*LOG(AGE)*), the probability of bankruptcy, and company size. We also control for leverage, the standard deviation of operating cash flows, the number of analysts following, the inverse Mills ratio, and new MWs.

In Models (6a) and (6b), we expect the coefficient on *NON-REMIATOR* to be positive because a higher credit rating indicates higher perceived risk of default, and we expect non-remediators to be perceived as having lower-quality debt relative to remediators. In Models (6c) and (6d), we expect the coefficient on *NON-REMIATOR* to be positive because we expect non-remediators to pay higher interest rates on debt.

<sup>18</sup> We measure credit ratings following [Mansi et al. \(2004\)](#), [Jiang \(2008\)](#), and [Li et al. \(2011\)](#), as the Standard & Poor's (S&P) long-term Domestic Issuer Senior Credit Rating, and we measure interest rates following [Pittman and Fortin \(2004\)](#), as interest expense divided by the average of short- plus long-term debt for the year.



### Equity Market Reactions

In untabulated analyses, we investigate the relation between non-remediation and market reactions. Following Hammersley et al. (2008), we search EDGAR for the filing containing the first disclosure of the failure to remediate. For this disclosure, we identify the filing date and time, and if this is a non-trading day or if the disclosure is filed after the close of trading, we move the event day (i.e., Day 0) forward accordingly. We are able to obtain stock price data from the Center for Research in Security Prices (CRSP) for 53 of our 55 non-remediating companies. For these companies, we investigate three alternative return measures—the raw event day return, the size-adjusted event day return using the equally weighted market return for companies in the same market capitalization decile, and the size-adjusted event day return using the value-weighted market return for companies in the same market capitalization decile. Our models include both pervasiveness measures, the number of MWs that recur in Year 1, the initial Year 0 market reaction, earnings surprise (when non-remediation is revealed within three days of earnings news), management intent to remediate, and the inverse Mills ratio. We expect the coefficient on *NON-REMIATOR* to be negative because the failure to remediate should be bad news to investors.

## UNIVARIATE RESULTS

### Characteristics of Companies Failing to Remediate Previously Disclosed Material Weaknesses

Table 3, Panel A presents descriptive statistics for the determinants of failing to remediate previously disclosed MWs, and Table 3, Panel B provides descriptive statistics for the consequences of non-remediation. Note that the variables in Panels A and B are measured at different points in time; the consequences variables in Panel B are measured at the end of Year 1, and the characteristics variables in Panel A are measured at the end of Year 0 (i.e., at the end of the year in which the company reported its first material weakness).

Panel A reveals that non-remediating companies are more likely to have entity-level weaknesses (25 percent) than are remediating companies (5 percent,  $p < 0.01$ ), and they report more MWs in the initial reporting cycle (mean = 4.04 versus 1.86 for remediating companies,  $p < 0.01$ ). Non-remediating companies also have more segments ( $p = 0.06$ ) and a larger increase in the number of segments ( $p = 0.03$ ), and are more likely to have foreign operations ( $p = 0.02$ ). Contrary to expectations, non-remediating companies do not differ with respect to company size<sup>19</sup> or the presence of prior-period losses, and are not more likely to experience CEO or CFO turnover between Years 0 and 1. Additionally, non-remediating companies are somewhat less risky (median  $p = 0.09$ ), are more likely to have restated their financial statements in the past three years ( $p = 0.10$ ), and are less likely to be in a litigious industry ( $p = 0.06$ ) than are remediating companies. Finally, non-remediating companies experience a larger increase in analyst following ( $p = 0.05$ ). No other variables are significantly different at conventional levels.

### Consequences of Failing to Remediate Previously Disclosed Material Weaknesses

Table 3, Panel B reports descriptive statistics for the consequences variables.<sup>20</sup> Non-remediating companies pay higher audit fees (mean = \$7,138,825 versus \$2,099,040,  $p = 0.03$ ),

<sup>19</sup> There is some evidence, however, that remediating companies increased in size more than did non-remediating companies (median  $p = 0.03$ ).

<sup>20</sup> Recall that we measure the consequences at the end of Year 1. This is because we assume that the parties involved in consequence-related decisions become aware that the company is not going to remediate from internal control disclosures made during Year 1. Companies must report changes in internal control systems in their quarterly and annual reports to shareholders, so the failure to remediate should be apparent to sophisticated parties (e.g., auditors, bond rating agencies, etc.) prior to the filing of the Year 1 Form 10-K.

**TABLE 3**  
**Descriptive Statistics**

**Panel A: Descriptive Statistics for the Determinants of Failing to Remediate Material Weaknesses (Means and (Medians))**

<u>Variable</u>	<u>Sample n = 55</u>	<u>Control Group n = 200</u>	<u>Tests for Differences</u>	<u>p-values</u>
<i>ENTITY_LEVEL_MW</i>	0.25 (0.00)	0.05 (0.00)	-4.79 (4.59)	0.00*** (0.00)***
<i>NUM_MW</i>	4.04 (3.00)	1.86 (1.00)	-6.69 (5.96)	0.00*** (0.00)***
<i>SEGMENTS</i>	2.67 (3.00)	2.21 (1.00)	-1.88 (2.17)	0.06* (0.03)**
<i>FOREIGN</i>	0.51 (1.00)	0.34 (0.00)	-2.31 (2.29)	0.02** (0.02)**
<i>M&amp;A</i>	0.33 (0.00)	0.28 (0.00)	-0.68 (0.68)	0.50 (0.50)
<i>RESTRUCTURE</i>	0.56 (1.00)	0.48 (0.00)	-1.16 (1.16)	0.25 (0.25)
<i>GROWTH</i>	0.17 (0.10)	0.18 (0.09)	0.20 (0.18)	0.84 (0.86)
<i>SIZE</i>	6.34 (6.04)	6.25 (6.08)	-0.47 (-0.20)	0.64 (0.84)
<i>LOSS</i>	0.47 (0.33)	0.43 (0.33)	-0.59 (0.70)	0.55 (0.49)
<i>CEO_CHANGE</i>	0.13 (0.00)	0.13 (0.00)	-0.04 (0.04)	0.96 (0.97)
<i>CFO_CHANGE</i>	0.29 (0.00)	0.28 (0.00)	-0.16 (0.16)	0.87 (0.87)
<i>INVENTORY</i>	0.27 (0.11)	0.34 (0.20)	1.18 (-0.65)	0.24 (0.52)
<i>ZSCORE</i>	3.42 (2.24)	4.27 (2.97)	0.99 (-1.72)	0.32 (0.09)*
<i>NUMEST</i>	5.64 (4.00)	5.56 (4.00)	-0.08 (-0.03)	0.93 (0.97)
<i>INSTI</i>	59.49 (63.50)	59.76 (65.62)	0.06 (0.09)	0.95 (0.93)
<i>RESTATEMENT</i>	0.45 (0.00)	0.34 (0.00)	-1.64 (1.63)	0.10* (0.10)*
<i>BIG4</i>	0.87 (1.00)	0.85 (1.00)	-0.51 (0.51)	0.61 (0.61)
<i>LITIGATION</i>	0.20 (0.00)	0.33 (0.00)	1.87 (-1.85)	0.06* (0.06)*
<i>STD_OCF</i>	0.11 (0.05)	0.10 (0.06)	-0.09 (0.16)	0.93 (0.87)
<i>ACSZ</i>	3.49 (3.00)	3.58 (3.00)	0.73 (-0.90)	0.47 (0.37)
<i>ACEXP</i>	1.64 (1.00)	1.52 (1.00)	-0.83 (0.47)	0.40 (0.64)

(continued on next page)

TABLE 3 (continued)

Variable	Sample n = 55	Control Group n = 200	Tests for Differences	p-values
CHG(SEGMENTS)	0.18 (0.00)	-0.04 (0.00)	-2.19 (1.65)	0.03** (0.10)*
CHG(FOREIGN)	0.02 (0.00)	0.04 (0.00)	0.44 (-0.44)	0.66 (0.66)
CHG(M&A)	0.02 (0.00)	0.00 (0.00)	-0.30 (0.30)	0.77 (0.77)
CHG(RESTRUCTURE)	0.00 (0.00)	0.04 (0.00)	0.84 (-0.82)	0.40 (0.41)
CHG(GROWTH)	0.02 (0.02)	0.02 (0.00)	-0.03 (0.74)	0.98 (0.46)
CHG(SIZE)	0.21 (0.05)	0.33 (0.25)	1.00 (-2.14)	0.32 (0.03)**
CHG(LOSS)	-0.05 (0.00)	-0.04 (0.00)	0.30 (-0.32)	0.77 (0.75)
CHG(INVENTORY)	0.01 (0.00)	-0.01 (0.00)	-1.35 (1.53)	0.18 (0.13)
CHG(ZSCORE)	0.22 (-0.08)	-0.35 (0.10)	-0.58 (-1.65)	0.56 (0.10)*
CHG(NUMEST)	1.18 (0.00)	0.34 (0.00)	-1.96 (0.76)	0.05** (0.45)
CHG(INSTI)	19.20 (13.51)	18.80 (13.04)	-0.10 (-0.28)	0.92 (0.78)
CHG(RESTATEMENT)	0.18 (0.00)	0.12 (0.00)	-0.96 (1.05)	0.34 (0.29)
CHG(BIG4)	-0.02 (0.00)	-0.08 (0.00)	-1.30 (1.30)	0.19 (0.19)
CHG(STD_OCF)	-0.02 (0.00)	-0.01 (0.00)	0.65 (0.51)	0.52 (0.61)
CHG(ACSZ)	0.29 (0.00)	0.08 (0.00)	-1.26 (0.81)	0.21 (0.42)
CHG(ACEXP)	0.25 (0.00)	0.21 (0.00)	-0.41 (0.18)	0.69 (0.86)

\*, \*\*, \*\*\* Denotes significance at the 0.10, 0.05, and 0.01 level, respectively.

Tests for differences are t-tests for differences in means and z-tests for differences in medians; p-values are two-tailed.

### Panel B: Descriptive Statistics for the Consequences of Failing to Remediate Material Weaknesses (Means and (Medians))

Variable	Sample n = 55	Control Group n = 200	Tests for Differences	p-values
Test Variables				
AUDIT_FEE	7,138,825 (1,918,100)	2,099,040 (1,140,000)	-2.28 (4.37)	0.03** (0.00)***
LOG(AUDIT_FEE)	14.72 (14.47)	14.02 (13.95)	-4.56 (4.37)	0.00*** (0.00)***
CHG(AUDIT_FEE)	0.01 (0.00)	0.01 (0.00)	-0.61 (0.95)	0.54 (0.34)

(continued on next page)

TABLE 3 (continued)

Variable	Sample n = 55	Control Group n = 200	Tests for Differences	p-values
<i>OPINION</i>	0.47 (0.00)	0.30 (0.00)	-2.50 (2.47)	0.01*** (0.01)***
<i>GCO</i>	0.07 (0.00)	0.02 (0.00)	-1.44 (1.98)	0.16 (0.05)**
<i>RESIGNATION</i>	0.09 (0.00)	0.07 (0.00)	-0.52 (0.52)	0.60 (0.60)
<i>DISMISSAL</i>	0.09 (0.00)	0.10 (0.00)	0.30 (-0.30)	0.76 (0.76)
<i>LATE FILER</i>	0.56 (1.00)	0.16 (0.00)	-5.50 (6.03)	0.00*** (0.00)***
<i>CHG(CREDIT_RATING)</i>	1.92 (0.50)	-0.31 (0.00)	-3.19 (2.96)	0.00*** (0.00)***
	n = 12	n = 52		
<i>CHG(INT_RATE)</i>	0.01 (0.01)	0.00 (0.00)	-1.64 (1.48)	0.10* (0.14)
	n = 32	n = 128		
Control Variables				
<i>ENTITY_LEVEL_MW</i>	0.11 (0.00)	0.05 (0.00)	-1.31 (1.59)	0.20 (0.11)
<i>NUM_MW</i>	4.04 (3.00)	1.86 (1.00)	-4.52 (15.79)	0.00*** (0.00)***
<i>LEVERAGE</i>	0.60 (0.54)	0.51 (0.48)	-1.98 (1.67)	0.05*** (0.09)*
<i>ROA</i>	0.03 (0.03)	0.07 (0.10)	2.32 (-3.52)	0.02** (0.00)***
<i>GROWTH</i>	0.17 (0.10)	0.20 (0.11)	0.69 (-0.21)	0.49 (0.83)
<i>SIZE</i>	6.11 (5.74)	6.25 (6.24)	0.56 (-1.33)	0.58 (0.18)
<i>SEGMENTS</i>	2.76 (3.00)	2.18 (1.00)	-2.36 (2.62)	0.02** (0.01)***
<i>BIG4</i>	0.76 (1.00)	0.74 (1.00)	-0.28 (0.28)	0.78 (0.78)
<i>NEWMW</i>	0.15 (0.00)	0.21 (0.00)	0.82 (0.71)	0.41 (0.48)
<i>LOSS</i>	0.50 (0.67)	0.39 (0.33)	-1.79 (1.88)	0.08* (0.06)*
<i>ZSCORE</i>	2.36 (2.25)	3.36 (2.95)	1.58 (-1.66)	0.11 (0.10)*
<i>TENURE</i>	8.75 (6.00)	8.20 (6.00)	-0.33 (0.14)	0.74 (0.89)
<i>AGE</i>	18.28 (13.00)	18.23 (12.00)	-0.01 (0.27)	0.99 (0.79)
<i>STD_OCF</i>	0.08 (0.05)	0.07 (0.05)	-0.26 (0.98)	0.79 (0.33)
<i>NUMEST</i>	5.41 (4.00)	5.76 (4.00)	0.40 (-0.68)	0.69 (0.50)
<i>CHG(LEVERAGE)</i>	0.06 (0.02)	0.02 (0.01)	-2.19 (1.77)	0.03** (0.08)*

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TABLE 3 (continued)

Variable	Sample n = 55	Control Group n = 200	Tests for Differences	p-values
CHG(ROA)	-0.01 (-0.01)	0.01 (0.01)	1.44 (-1.83)	0.15 (0.07)*
CHG(GROWTH)	0.01 (0.03)	0.02 (0.02)	0.36 (-0.18)	0.72 (0.86)
CHG(SIZE)	-0.23 (-0.14)	0.00 (0.04)	2.76 (-2.36)	0.01*** (0.02)**
CHG(SEGMENTS)	0.09 (0.00)	-0.02 (0.00)	-1.23 (0.87)	0.22 (0.39)
CHG(BIG4)	-0.11 (0.00)	-0.10 (0.00)	0.18 (-0.16)	0.86 (0.87)
CHG(ZSCORE)	-1.34 (-0.30)	-1.24 (-0.08)	0.14 (-0.74)	0.89 (0.46)
CHG(TENURE)	0.22 (1.00)	0.04 (1.00)	-0.46 (0.44)	0.65 (0.66)
CHG(LOG(AGE))	0.14 (0.08)	0.12 (0.10)	-0.96 (-0.38)	0.34 (0.71)
CHG(STD_OCF)	-0.01 (0.00)	-0.01 (0.00)	-0.19 (0.22)	0.85 (0.83)
CHG(NUMEST)	3.41 (2.00)	4.20 (2.00)	0.92 (-1.12)	0.36 (0.26)

\*, \*\*, \*\*\* Denotes significance at the 0.10, 0.05, and 0.01 level, respectively.

Tests for differences are t-tests for differences in means and z-tests for differences in medians; p-values are two-tailed.

are more likely to receive modified audit opinions (proportion = 47 versus 30 percent,  $p = 0.01$ ), are more likely to file late (56 versus 16 percent,  $p < 0.01$ ), experience poorer credit ratings (1.92 versus  $-0.31$ ,  $p < 0.01$ ),<sup>21</sup> and experience larger increases in interest rates (0.01 versus 0.001,  $p = 0.10$ ) relative to remediating companies. However, contrary to expectations, non-remediating companies are not more likely to receive going-concern opinions (proportion = 7 versus 2 percent,  $p = 0.16$ ), do not experience more frequent auditor resignations (9 versus 7 percent,  $p = 0.60$ ), or dismiss their auditors more often (9 versus 10 percent,  $p = 0.76$ ) than remediating companies.<sup>22</sup> With respect to control variables, non-remediating companies report more MWs in Year 0 ( $p < 0.01$ ), are more highly leveraged ( $p = 0.05$ ), and are becoming more highly leveraged ( $p = 0.03$ ). In addition, non-remediating companies are less profitable ( $p = 0.02$ ), and are becoming less profitable (median  $p = 0.07$ ). Finally, they also have more segments ( $p = 0.02$ ), are more likely to report prior losses ( $p = 0.08$ ), are more risky (median  $p = 0.10$ ), and are becoming smaller ( $p = 0.01$ ).

<sup>21</sup> Recall that lower credit ratings are better, so decreases represent improvements and *vice versa*.

<sup>22</sup> We also examine the univariate differences in our consequences variables between the 19 companies that do not remediate in Year 2 and the 28 that remediate in Year 2. We find some evidence that non-remediators pay higher audit fees, are more likely to dismiss their auditors, and are more likely to file late, but other consequences do not differ between these groups. However, we caution the reader to interpret all univariate findings with caution.

**TABLE 4**  
**Determinants of Failing to Remediate Previously Disclosed Material Weaknesses**

$$\begin{aligned}
 \text{NON-REMIATOR}_{it} = & \beta_0 + \beta_1 \text{PERVASIVENESS}_{it-1} + \beta_2 \text{SEGMENTS}_{it-1} \\
 & + \beta_3 \text{FOREIGN}_{it-1} + \beta_4 \text{M\&A}_{it-1} + \beta_5 \text{RESTRUCTURE}_{it-1} \\
 & + \beta_6 \text{GROWTH}_{it-1} + \beta_7 \text{SIZE}_{it-1} + \beta_8 \text{LOSS}_{it-1} \\
 & + \beta_9 \text{CEO\_CHANGE}_{it} + \beta_{10} \text{CFO\_CHANGE}_{it} \\
 & + \beta_{11} \text{INVENTORY}_{it-1} + \beta_{12} \text{ZSCORE}_{it-1} + \beta_{13} \text{RESTATEMENT}_{it-1} \\
 & + \beta_{14} \text{BIG4}_{it-1} + \beta_{15} \text{LITIGATION}_{it-1} + \beta_{16} \text{NUMEST}_{it-1} \\
 & + \beta_{17} \text{INSTI}_{it-1} + \beta_{18} \text{STD\_OCF}_{it-1} + \beta_{19} \text{ACSZ}_{it-1} + \beta_{20} \text{ACEXP}_{it-1} \\
 & + \beta_{21} \text{CHG}(\text{SEGMENTS})_{it-1} + \beta_{22} \text{CHG}(\text{FOREIGN})_{it-1} \\
 & + \beta_{23} \text{CHG}(\text{M\&A})_{it-1} + \beta_{24} \text{CHG}(\text{RESTRUCTURE})_{it-1} \\
 & + \beta_{25} \text{CHG}(\text{GROWTH})_{it-1} + \beta_{26} \text{CHG}(\text{SIZE})_{it-1} \\
 & + \beta_{27} \text{CHG}(\text{LOSS})_{it-1} + \beta_{28} \text{CHG}(\text{INVENTORY})_{it-1} \\
 & + \beta_{29} \text{CHG}(\text{ZSCORE})_{it-1} + \beta_{30} \text{CHG}(\text{RESTATEMENT})_{it-1} \\
 & + \beta_{31} \text{CHG}(\text{BIG4})_{it-1} + \beta_{32} \text{CHG}(\text{NUMEST})_{it-1} \\
 & + \beta_{33} \text{CHG}(\text{INSTI})_{it-1} + \beta_{34} \text{CHG}(\text{STD\_OCF})_{it-1} \\
 & + \beta_{35} \text{CHG}(\text{ACSZ})_{it-1} + \beta_{36} \text{CHG}(\text{ACEXP})_{it-1} + \varepsilon_{it}.
 \end{aligned} \tag{1}$$

	Predicted Sign	Model (1a) Coefficient (p-value)	Model (1b) Coefficient (p-value)	Model (1c) Coefficient (p-value)
Intercept	?	-0.076 (0.930)	-0.767 (0.395)	-0.688 (0.449)
ENTITY_LEVEL_MW	+	1.320*** ( $<0.001$ )		0.354 (0.217)
NUM_MW	+		0.276*** ( $<0.001$ )	0.240*** ( $<0.001$ )
SEGMENTS	+	0.081 (0.128)	0.102* (0.087)	0.097* (0.099)
FOREIGN	+	0.566*** (0.008)	0.649*** (0.004)	0.626*** (0.005)
M&A	+	-0.119 (0.666)	0.027 (0.462)	-0.012 (0.517)
RESTRUCTURE	+	-0.087 (0.639)	-0.105 (0.660)	-0.117 (0.677)
GROWTH	+	-0.251 (0.713)	-0.194 (0.663)	-0.230 (0.689)
SIZE	-	0.031 (0.596)	0.022 (0.567)	0.034 (0.601)
LOSS	+	0.199 (0.263)	0.003 (0.497)	0.038 (0.454)
CEO_CHANGE	-	-0.141 (0.337)	-0.153 (0.329)	-0.143 (0.339)
CFO_CHANGE	-	0.022 (0.536)	0.045 (0.573)	0.054 (0.588)
INVENTORY	+	-0.177 (0.726)	-0.315 (0.842)	-0.308 (0.836)

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TABLE 4 (continued)

	Predicted Sign	Model (1a) Coefficient (p-value)	Model (1b) Coefficient (p-value)	Model (1c) Coefficient (p-value)
ZSCORE	-	-0.026 (0.158)	-0.008 (0.365)	-0.011 (0.331)
RESTATEMENT	+	0.068 (0.403)	-0.082 (0.610)	-0.081 (0.608)
BIG4	?	-0.236 (0.557)	-0.095 (0.816)	-0.133 (0.748)
LITIGATION	-	-0.314 (0.116)	-0.121 (0.329)	-0.160 (0.280)
NUMEST	-	-0.023 (0.232)	-0.029 (0.185)	-0.031 (0.173)
INSTI	-	0.004 (0.758)	0.005 (0.850)	0.006 (0.864)
STD_OCF	+	-0.006 (0.503)	-0.509 (0.719)	-0.446 (0.691)
ACSZ	-	-0.319** (0.026)	-0.313** (0.032)	-0.329** (0.027)
ACEXP	-	0.044 (0.630)	0.012 (0.535)	0.015 (0.542)
CHG(SEGMENTS)	+	0.372** (0.020)	0.319** (0.038)	0.335** (0.034)
CHG(FOREIGN)	+	-0.434 (0.834)	-0.545 (0.882)	-0.533 (0.875)
CHG(M&A)	+	0.104 (0.366)	-0.008 (0.510)	0.002 (0.497)
CHG(RESTRUCTURE)	+	-0.004 (0.504)	-0.296 (0.747)	-0.219 (0.686)
CHG(GROWTH)	+	0.070 (0.400)	-0.016 (0.522)	-0.008 (0.510)
CHG(SIZE)	-	-0.265* (0.051)	-0.125 (0.222)	-0.135 (0.205)
CHG(LOSS)	+	-0.100 (0.566)	0.240 (0.350)	0.189 (0.619)
CHG(INVENTORY)	+	2.022 (0.125)	2.358 (0.110)	2.459* (0.099)
CHG(ZSCORE)	-	0.036 (0.925)	0.022 (0.838)	0.023 (0.841)
CHG(RESTATEMENT)	+	0.160 (0.302)	-0.012 (0.515)	0.019 (0.477)
CHG(BIG4)	?	0.718 (0.166)	0.604 (0.268)	0.635 (0.245)
CHG(NUMEST)	-	0.113 (0.989)	0.092 (0.972)	0.097 (0.977)
CHG(INSTI)	-	-0.005 (0.160)	-0.004 (0.226)	-0.004 (0.214)
CHG(STD_OCF)	+	1.190 (0.277)	0.611 (0.378)	0.895 (0.328)
CHG(ACSZ)	-	0.178 (0.953)	0.109 (0.839)	0.122 (0.865)

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TABLE 4 (continued)

	Predicted Sign	Model (1a) Coefficient (p-value)	Model (1b) Coefficient (p-value)	Model (1c) Coefficient (p-value)
CHG(ACEXP)	–	0.077 (0.676)	0.095 (0.702)	0.090 (0.690)
Pseudo R <sup>2</sup>		30.27%	36.22%	36.52%
n		255	255	255

\*, \*\*, \*\*\* Denotes significance at the 0.10, 0.05, and 0.01 level, respectively.

Refer to Table 2 for variable definitions. p-values are one-tailed when directional predictions are made, and two-tailed otherwise.

## MULTIVARIATE RESULTS

### Characteristics of Companies Failing to Remediate Previously Disclosed Material Weaknesses

Table 4 provides regression results for the determinants of the failure to remediate previously disclosed MWs. Because our two measures of pervasiveness (entity- versus account-level and number of MWs) are highly correlated, we present models with each individually (Models (1a) and (1b)), as well as a model with both (Model (1c)).

Results from estimating Models (1a) and (1b) reveal that, consistent with expectations, when previously disclosed MWs were characterized as at the entity level (i.e., are more severe), or when companies report more MWs, companies are more likely to fail to remediate (both  $p < 0.001$ ). In addition, companies with more complex operations (i.e., with more segments in Model (1b) and with foreign operations) are more likely to fail to remediate, and companies with larger audit committees are more likely to remediate, consistent with Goh (2009). Contrary to expectations, our results suggest that CEO turnover and CFO turnover do not affect remediation.

In Model (1c), we enter both pervasiveness measures into the regression. Here, the number of MWs initially reported remains significant ( $p < 0.001$ ), but the entity-level indicator is no longer significant ( $p = 0.217$ ). This may be due to the high correlation between our two pervasiveness measures ( $\rho = 0.65$ ,  $p < 0.001$ ). Results on other explanatory variables are consistent with those from estimating Models (1a) and (1b). Overall, we find strong evidence that the pervasiveness of previously disclosed MWs is a primary determinant of whether management fails to remediate the weaknesses.

### Consequences of Failing to Remediate Previously Disclosed Material Weaknesses

#### Audit Fees

Table 5 investigates the association between failing to remediate previously disclosed MWs and changes in audit fees. Contrary to expectations, we do not find that the percentage increase in audit fees is greater for non-remediating companies ( $p = 0.168$ ), but we do find that the percentage increase in audit fees is greater for companies that report more MWs ( $p = 0.041$ ) (Model (2a)), and that this increase in audit fees exists only for those companies with more MWs that fail to remediate ( $p = 0.023$ ) (Model (2b)). Thus, audit fees are increasing in the pervasiveness of non-remediated internal control problems. We also find some evidence that the increase in audit fees is smaller for companies with larger improvements in profitability, for companies receiving new other-than-



**TABLE 5**

**The Association between the Non-Remediation of Previously Disclosed Material Weaknesses and Percentage Changes in Audit Fees**

$$\begin{aligned}
 CHG(AUDIT\_FEE)_{it} = & \beta_0 + \beta_1 NON-REMIADIATOR_{it} + \beta_2 ENTITY\_LEVEL\_MW_{it-1} \\
 & + \beta_3 NUM\_MW_{it-1} + \beta_4 LEVERAGE_{it} + \beta_5 ROA_{it} + \beta_6 GROWTH_{it} \\
 & + \beta_7 OPINION_{it} + \beta_8 SIZE_{it} + \beta_9 SEGMENTS_{it} + \beta_{10} BIG4_{it} \\
 & + \beta_{11} CHG(LEVERAGE)_{it} + \beta_{12} CHG(ROA)_{it} \\
 & + \beta_{13} CHG(GROWTH)_{it} + \beta_{14} CHG(OPINION)_{it} + \beta_{15} CHG(SIZE)_{it} \\
 & + \beta_{16} CHG(SEGMENTS)_{it} + \beta_{17} CHG(BIG4)_{it} + \beta_{18} MILLS_{it} \\
 & + \beta_{19} NEWMW_{it} + \varepsilon_{it}.
 \end{aligned}
 \tag{2a}$$

$$\begin{aligned}
 CHG(AUDIT\_FEE)_{it} = & \beta_0 + \beta_1 NON-REMIADIATOR_{it} + \beta_2 ENTITY\_LEVEL\_MW_{it-1} \\
 & + \beta_3 NUM\_MW_{it-1} \\
 & + \beta_4 NON-REMIADIATOR_{it} * ENTITY\_LEVEL\_MW_{it-1} \\
 & + \beta_5 NON-REMIADIATOR_{it} * NUM\_MW_{it-1} + \beta_6 LEVERAGE_{it} \\
 & + \beta_7 ROA_{it} + \beta_8 GROWTH_{it} + \beta_9 OPINION_{it} + \beta_{10} SIZE_{it} \\
 & + \beta_{11} SEGMENTS_{it} + \beta_{12} BIG4_{it} + \beta_{13} CHG(LEVERAGE)_{it} \\
 & + \beta_{14} CHG(ROA)_{it} + \beta_{15} CHG(GROWTH)_{it} + \beta_{16} CHG(OPINION)_{it} \\
 & + \beta_{17} CHG(SIZE)_{it} + \beta_{18} CHG(SEGMENTS)_{it} + \beta_{19} CHG(BIG4)_{it} \\
 & + \beta_{20} MILLS_{it} + \beta_{21} NEWMW_{it} + \varepsilon_{it}.
 \end{aligned}
 \tag{2b}$$

Variable	Predicted Sign	Model (2a) Coefficient (p-value)	Model (2b) Coefficient (p-value)
Intercept	?	0.012 (0.235)	0.019* (0.073)
NON-REMIADIATOR	+	0.005 (0.168)	-0.006 (0.797)
ENTITY_LEVEL_MW	+	-0.012 (0.899)	-0.005 (0.670)
NUM_MW	+	0.002** (0.041)	0.000 (0.501)
NON-REMIADIATOR * ENTITY_LEVEL_MW	+		-0.004 (0.577)
NON-REMIADIATOR * NUM_MW	+		0.004** (0.023)
LEVERAGE	+	-0.008 (0.860)	-0.008 (0.866)
ROA	-	-0.005 (0.371)	-0.008 (0.287)
GROWTH	?	0.007 (0.205)	0.007 (0.210)
OPINION	+	0.005 (0.149)	0.005 (0.136)
SIZE	+	0.000 (0.524)	0.000 (0.560)
SEGMENTS	+	-0.001 (0.713)	0.000 (0.661)

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TABLE 5 (continued)

Variable	Predicted Sign	Model (2a) Coefficient (p-value)	Model (2b) Coefficient (p-value)
<i>BIG4</i>	+	0.000 (0.512)	-0.002 (0.611)
<i>CHG(LEVERAGE)</i>	+	0.022* (0.090)	0.021 (0.107)
<i>CHG(ROA)</i>	-	-0.046** (0.014)	-0.041** (0.026)
<i>CHG(GROWTH)</i>	?	0.008 (0.301)	0.009 (0.230)
<i>CHG(OPINION)</i>	+	0.007** (0.044)	0.007** (0.039)
<i>CHG(SIZE)</i>	+	0.003 (0.255)	0.002 (0.304)
<i>CHG(SEGMENTS)</i>	+	0.000 (0.515)	-0.001 (0.683)
<i>CHG(BIG4)</i>	+	0.017*** (0.007)	0.018*** (0.006)
<i>MILLS</i>	?	-0.011** (0.041)	-0.015*** (0.010)
<i>NEWMW</i>	+	0.003 (0.108)	0.003 (0.137)
Adjusted R <sup>2</sup>		11.65%	12.86%
n		255	255

\*, \*\*, \*\*\* Denotes significance at the 0.10, 0.05, and 0.01 level, respectively.

Refer to Table 2 for variable definitions. p-values are one-tailed when directional predictions are made, and two-tailed otherwise.

unqualified financial statement audit opinions in Year 1, and for companies switching to Big 4 auditors.

### *Audit Opinions*

Table 6 investigates the association between failing to remediate previously disclosed MWs and subsequent modified or going-concern audit opinions. Consistent with expectations, results from estimating Models (3a) and (3b) reveal that non-remediating companies are more likely to receive modified audit opinions ( $p = 0.085$  and  $p = 0.082$ ); results from estimating Models (3c) and (3d) reveal that they are more likely to receive going concern opinions ( $p = 0.059$  and  $p = 0.018$ ). We also find that companies are more likely to receive modified (going-concern) audit opinions if they received modified (going-concern) audit opinions in the prior year, and that smaller companies are more likely to receive going-concern opinions. Finally, companies are more likely to receive going-concern opinions when they disclose entity-level MWs ( $p = 0.051$  and  $p = 0.092$ ).

### *Auditor Resignations*

Table 7 investigates the association between failing to remediate previously disclosed MWs and subsequent auditor resignations. Contrary to expectations, we find no evidence that non-

TABLE 6

The Association between the Non-Remediation of Previously Disclosed Material Weaknesses and Subsequent Modified Audit Opinion and Going-Concern Opinion

$$OPINION_{it} = \beta_0 + \beta_1 NON-REMIATOR_{it} + \beta_2 ENTITY\_LEVEL\_MW_{it-1} + \beta_3 NUM\_MW_{it-1} + \beta_4 OPINION_{it-1} + \beta_5 LEVERAGE_{it} + \beta_6 ROA_{it} + \beta_7 GROWTH_{it} + \beta_8 LOSS_{it} + \beta_9 SIZE_{it} + \beta_{10} ZSCORE_{it} + \beta_{11} BIG4_{it} + \beta_{12} MILLS_{it} + \beta_{13} NEWMW_{it} + \epsilon_{it} \tag{3a}$$

$$OPINION_{it} = \beta_0 + \beta_1 NON-REMIATOR_{it} + \beta_2 ENTITY\_LEVEL\_MW_{it-1} + \beta_3 NUM\_MW_{it-1} + \beta_4 NON-REMIATOR_{it} * ENTITY\_LEVEL\_MW_{it-1} + \beta_5 NON-REMIATOR_{it} * NUM\_MW_{it-1} + \beta_6 OPINION_{it-1} + \beta_7 LEVERAGE_{it} + \beta_8 ROA_{it} + \beta_9 GROWTH_{it} + \beta_{10} LOSS_{it} + \beta_{11} SIZE_{it} + \beta_{12} ZSCORE_{it} + \beta_{13} BIG4_{it} + \beta_{14} MILLS_{it} + \beta_{15} NEWMW_{it} + \epsilon_{it} \tag{3b}$$

$$GCO_{it} = \beta_0 + \beta_1 NON-REMIATOR_{it} + \beta_2 ENTITY\_LEVEL\_MW_{it-1} + \beta_3 NUM\_MW_{it-1} + \beta_4 GCO_{it-1} + \beta_5 LEVERAGE_{it} + \beta_6 ROA_{it} + \beta_7 GROWTH_{it} + \beta_8 LOSS_{it} + \beta_9 SIZE_{it} + \beta_{10} ZSCORE_{it} + \beta_{11} BIG4_{it} + \beta_{12} MILLS_{it} + \beta_{13} NEWMW_{it} + \epsilon_{it} \tag{3c}$$

$$GCO_{it} = \beta_0 + \beta_1 NON-REMIATOR_{it} + \beta_2 ENTITY\_LEVEL\_MW_{it-1} + \beta_3 NUM\_MW_{it-1} + \beta_4 NON-REMIATOR_{it} * ENTITY\_LEVEL\_MW_{it-1} + \beta_5 NON-REMIATOR_{it} * NUM\_MW_{it-1} + \beta_6 GCO_{it-1} + \beta_7 LEVERAGE_{it} + \beta_8 ROA_{it} + \beta_9 GROWTH_{it} + \beta_{10} LOSS_{it} + \beta_{11} SIZE_{it} + \beta_{12} ZSCORE_{it} + \beta_{13} BIG4_{it} + \beta_{14} MILLS_{it} + \beta_{15} NEWMW_{it} + \epsilon_{it} \tag{3d}$$

Variable	Predicted Sign	Model (3a) Coefficient (p-value)	Model (3b) Coefficient (p-value)	Model (3c) Coefficient (p-value)	Model (3d) Coefficient (p-value)
Intercept	?	-3.003*** (0.001)	-3.207*** (0.001)	1.158 (0.799)	-0.015 (0.998)
NON-REMIATOR	+	0.561* (0.085)	0.791* (0.082)	2.326* (0.059)	6.096** (0.018)
ENTITY_LEVEL_MW	+	-0.140 (0.567)	-1.043 (0.782)	5.086* (0.051)	5.182* (0.092)
NUM_MW	+	0.005 (0.484)	0.089 (0.293)	0.040 (0.462)	0.460 (0.255)
NON-REMIATOR * ENTITY_LEVEL_MW	+		1.605 (0.177)		-8.550 (0.512)
NON-REMIATOR * NUM_MW	+		-0.135 (0.760)		-1.407 (0.953)
OPINION <sub>it-1</sub>	?	1.581*** (<0.001)	1.573*** (<0.001)		
GCO <sub>it-1</sub>	?			5.173 (0.107)	7.504* (0.078)
LEVERAGE	+	0.550 (0.196)	0.563 (0.191)	0.755 (0.335)	1.314 (0.271)
ROA	-	-0.779 (0.278)	-0.776 (0.278)	-1.406 (0.331)	-1.288 (0.375)

(continued on next page)

TABLE 6 (continued)

Variable	Predicted Sign	Model (3a) Coefficient (p-value)	Model (3b) Coefficient (p-value)	Model (3c) Coefficient (p-value)	Model (3d) Coefficient (p-value)
<i>GROWTH</i>	–	–0.122 (0.397)	–0.088 (0.425)	–0.994 (0.236)	–0.691 (0.329)
<i>LOSS</i>	+	0.289 (0.275)	0.291 (0.273)	2.566 (0.179)	3.530 (0.157)
<i>SIZE</i>	–	0.090 (0.757)	0.093 (0.765)	–1.930**	–2.580**
<i>ZSCORE</i>	+	–0.018 (0.633)	–0.015 (0.612)	–0.130 (0.744)	0.013 (0.481)
<i>BIG4</i>	?	0.597 (0.149)	0.638 (0.128)	2.871 (0.222)	4.266 (0.196)
<i>MILLS</i>	?	–0.129 (0.770)	–0.087 (0.851)	–3.372 (0.190)	–2.210 (0.542)
<i>NEWMW</i>	+	0.144 (0.228)	0.154 (0.215)	–6.594 (0.519)	–6.117 (0.525)
Pseudo R <sup>2</sup>		25.69%	26.11%	65.53%	71.56%
n		255	255	255	255

\*, \*\*, \*\*\* Denotes significance at the 0.10, 0.05, and 0.01 level, respectively.

Refer to Table 2 for variable definitions. p-values are one-tailed when directional predictions are made, and two-tailed otherwise.

remediating companies are more likely than non-remediating companies to experience auditor resignations in Year 1 (Model (4a),  $p = 0.371$ ). However, results from estimating Model (4b) reveal that auditor resignations are more likely for non-remediating companies as the number of MWs increases ( $p = 0.073$ ). In addition, the presence of an entity-level material weakness increases the probability that the auditor resigns ( $p = 0.023$ ). We also find that auditors are more likely to resign from companies reporting losses and from companies receiving going-concern opinions in the prior year, and that Big 4 auditors are less likely to resign.<sup>23</sup>

In untabulated analyses of Year 2 resignations, we find that the interaction between the number of Year 0 MWs and the failure to remediate is significant, revealing that auditors are increasingly likely in Year 2 to resign from companies that fail to remediate when the number of MWs is greater ( $p = 0.053$ ), even after controlling for Year 1 resignations and for the pervasiveness of the internal control problems. Again, we observe no difference in Year 2 dismissals for the remediating versus non-remediating companies.

<sup>23</sup> In untabulated analyses, we examine auditor dismissals, because Elder et al. (2009) find a positive association between initial material weakness reports and auditor dismissals. Note that Williams (1988) argues that companies may dismiss their auditors to increase audit effectiveness, to gain access to different services, to increase their image or reputation, or to reduce audit fees. Alternatively, Lennox (2000) suggests that clients may change auditors to receive more favorable audit opinions, but in our case, we suspect that clients receiving adverse internal control opinions would lack sufficient market power to opinion shop. Given that auditor dismissals are more likely when MWs are initially reported, we expect that auditors will be even more likely to be dismissed by non-remediating companies than by remediating companies. We find that larger companies and companies with Big 4 auditors are less likely to dismiss their auditors, but find no relation between non-remediation and auditor dismissals.

**TABLE 7**

**The Association between the Non-Remediation of Previously Disclosed Material Weaknesses and Subsequent Auditor Resignation**

$$\begin{aligned}
 RESIGNATION_{it} = & \beta_0 + \beta_1 NON-REMIATOR_{it} + \beta_2 ENTITY\_LEVEL\_MW_{it-1} \\
 & + \beta_3 NUM\_MW_{it-1} + \beta_4 RESIGNATION_{it-1} + \beta_5 LEVERAGE_{it} + \beta_6 ROA_{it} \\
 & + \beta_7 GROWTH_{it} + \beta_8 LOSS_{it} + \beta_9 GCO_{it-1} + \beta_{10} SIZE_{it} \\
 & + \beta_{11} LOG(AUDIT\_FEE)_{it} + \beta_{12} BIG4_{it} + \beta_{13} MILLS_{it} + \beta_{14} NEWMW_{it} \\
 & + \varepsilon_{it}.
 \end{aligned}
 \tag{4a}$$

$$\begin{aligned}
 RESIGNATION_{it} = & \beta_0 + \beta_1 NON-REMIATOR_{it} + \beta_2 ENTITY\_LEVEL\_MW_{it-1} \\
 & + \beta_3 NUM\_MW_{it-1} \\
 & + \beta_4 NON-REMIATOR_{it} * ENTITY\_LEVEL\_MW_{it-1} \\
 & + \beta_5 NON-REMIATOR_{it} * NUM\_MW_{it-1} + \beta_6 RESIGNATION_{it-1} \\
 & + \beta_7 LEVERAGE_{it} + \beta_8 ROA_{it} + \beta_9 GROWTH_{it} + \beta_{10} LOSS_{it} \\
 & + \beta_{11} GCO_{it-1} + \beta_{12} SIZE_{it} + \beta_{13} LOG(AUDIT\_FEE)_{it} + \beta_{14} BIG4_{it} \\
 & + \beta_{15} MILLS_{it} + \beta_{16} NEWMW_{it} + \varepsilon_{it}.
 \end{aligned}
 \tag{4b}$$

Variable	Predicted Sign	Model (4a) Coefficient (p-value)	Model (4b) Coefficient (p-value)
Intercept	?	3.257 (0.554)	3.961 (0.492)
NON-REMIATOR	+	0.262 (0.371)	-0.683 (0.699)
ENTITY_LEVEL_MW	+	0.841 (0.203)	3.105** (0.023)
NUM_MW	+	0.174 (0.185)	-0.162 (0.720)
NON-REMIATOR * ENTITY_LEVEL_MW	+		-3.722 (0.955)
NON-REMIATOR * NUM_MW	+		0.501* (0.073)
RESIGNATION <sub>it-1</sub>	-	-1.087 (0.150)	-1.457* (0.093)
LEVERAGE	+	-1.596 (0.904)	-1.478 (0.884)
ROA	-	5.602 (0.982)	5.842 (0.984)
GROWTH	-	0.265 (0.639)	0.264 (0.637)
LOSS	+	1.894** (0.025)	2.068** (0.022)
GCO	?	3.132* (0.072)	3.379** (0.046)
SIZE	-	-0.078 (0.424)	-0.071 (0.433)
LOG(AUDIT_FEE)	-	-0.404 (0.206)	-0.413 (0.208)

(continued on next page)

TABLE 7 (continued)

Variable	Predicted Sign	Model (4a) Coefficient (p-value)	Model (4b) Coefficient (p-value)
BIG4	–	–2.245*** (0.001)	–2.635*** ( $<0.001$ )
MILLS	?	0.142 (0.848)	–0.066 (0.937)
NEWMW	+	0.447 (0.105)	0.416 (0.127)
Pseudo R <sup>2</sup>		37.51%	40.27%
n		255	255

\*, \*\*, \*\*\* Denotes significance at the 0.10, 0.05, and 0.01 level, respectively.

Refer to Table 2 for variable definitions. p-values are one-tailed when directional predictions are made, and two-tailed otherwise.

### Late Filing

Table 8 investigates the association between failing to remediate previously disclosed MWs and late filings of annual reports. Consistent with expectations, we find that non-remediating companies are more likely to file late ( $p < 0.001$  and  $p = 0.004$ ), and that companies reporting more material weaknesses are more likely to file late ( $p = 0.021$  and  $p = 0.091$ ). We also find that clients of Big 4 auditors are less likely to file late.

### Credit Market Effects

Table 9, Panel A investigates the association between failing to remediate previously disclosed MWs and changes in credit ratings.<sup>24</sup> Contrary to expectations, in Model (6a), we find no evidence that S&P senior credit ratings are associated with the failure to remediate ( $p = 0.165$ ).<sup>25</sup> However, Model (6b) reveals an increase in credit ratings when non-remediating companies report entity-level MWs ( $p = 0.037$ ). Because an increase in credit ratings indicates lower perceived creditworthiness, these results indicate a significant decrease in perceived creditworthiness when non-remediating companies report entity-level weaknesses. We also find that credit ratings decrease (so perceived creditworthiness is higher) when companies have Big 4 auditors, when companies become less highly leveraged, and when companies are growing.

Table 9, Panel B investigates the association between failing to remediate previously disclosed MWs and changes in the cost of debt capital. Consistent with expectations, we find a greater increase in interest rates for non-remediating companies ( $p = 0.036$  and  $p = 0.022$ ).<sup>26</sup> We also find that interest rates decrease with changes in auditor tenure.

<sup>24</sup> An alternative measure of the effect on the cost of debt is the yield to maturity on the company's outstanding bonds. Because the Securities Data Corporation bond data contain only 23 observations for our sample, we do not provide regression results, but untabulated univariate analysis reveals that the yield to maturity is positively associated with non-remediation ( $p = 0.038$ ).

<sup>25</sup> We follow Jiang (2008) in transforming S&P credit ratings to range between 1 (representing an AAA credit rating) and 17 (representing a credit rating of no greater than CCC+). We find that credit ratings increase (implying a greater risk of default) by 3.29 (from Model (6b)), on average, when companies do not remediate in the presence of an entity-level weakness.

<sup>26</sup> Specifically, interest rates increase by 1.3 percent, on average, when companies do not remediate.

**TABLE 8**

**The Association between the Non-Remediation of Previously Disclosed Material Weaknesses and Subsequent Late Filing**

$$\begin{aligned}
 \text{LATE FILER}_{it} = & \beta_0 + \beta_1 \text{NON-REMIADIATOR}_{it} + \beta_2 \text{ENTITY\_LEVEL\_MW}_{it-1} \\
 & + \beta_3 \text{NUM\_MW}_{it-1} + \beta_4 \text{LATE FILER}_{it-1} + \beta_5 \text{LEVERAGE}_{it} + \beta_6 \text{ROA}_{it} \\
 & + \beta_7 \text{GROWTH}_{it} + \beta_8 \text{LOSS}_{it} + \beta_9 \text{OPINION}_{it-1} + \beta_{10} \text{SIZE}_{it} \\
 & + \beta_{11} \text{LOG(AUDIT\_FEE)}_{it} + \beta_{12} \text{BIG4}_{it} + \beta_{13} \text{MILLS}_{it} + \beta_{14} \text{NEWMW}_{it} \\
 & + \varepsilon_{it}.
 \end{aligned}
 \tag{5a}$$

$$\begin{aligned}
 \text{LATE FILER}_{it} = & \beta_0 + \beta_1 \text{NON-REMIADIATOR}_{it} + \beta_2 \text{ENTITY\_LEVEL\_MW}_{it-1} \\
 & + \beta_3 \text{NUM\_MW}_{it-1} + \beta_4 \text{NON-REMIADIATOR}_{it} * \text{ENTITY\_LEVEL\_MW}_{it-1} \\
 & + \beta_5 \text{NON-REMIADIATOR}_{it} * \text{NUM\_MW}_{it-1} + \beta_6 \text{LATE FILER}_{it-1} \\
 & + \beta_7 \text{LEVERAGE}_{it} + \beta_8 \text{ROA}_{it} + \beta_9 \text{GROWTH}_{it} + \beta_{10} \text{LOSS}_{it} \\
 & + \beta_{11} \text{OPINION}_{it-1} + \beta_{12} \text{SIZE}_{it} + \beta_{13} \text{LOG(AUDIT\_FEE)}_{it} + \beta_{14} \text{BIG4}_{it} \\
 & + \beta_{15} \text{MILLS}_{it} + \beta_{16} \text{NEWMW}_{it} + \varepsilon_{it}.
 \end{aligned}
 \tag{5b}$$

Variable	Predicted Sign	Model (5a) Coefficient (p-value)	Model (5b) Coefficient (p-value)
Intercept	?	-4.262 (0.133)	-4.210 (0.138)
NON-REMIADIATOR	+	1.717*** (<0.001)	1.596*** (0.004)
ENTITY_LEVEL_MW	+	-0.805 (0.851)	-0.865 (0.782)
NUM_MW	+	0.236** (0.021)	0.214* (0.091)
NON-REMIADIATOR * ENTITY_LEVEL_MW	+		0.201 (0.449)
NON-REMIADIATOR * NUM_MW	+		0.044 (0.410)
LATE FILER <sub>it-1</sub>	?	-0.068 (0.854)	-0.041 (0.913)
LEVERAGE	+	-0.576 (0.819)	-0.592 (0.824)
ROA	-	-0.310 (0.410)	-0.369 (0.394)
GROWTH	?	0.192 (0.679)	0.196 (0.673)
LOSS	+	-0.250 (0.680)	-0.263 (0.688)
OPINION	+	0.395 (0.133)	0.400 (0.131)
SIZE	?	-0.115 (0.516)	-0.119 (0.505)
LOG(AUDIT_FEE)	?	0.272 (0.290)	0.275 (0.287)
BIG4	-	-0.686* (0.056)	-0.692* (0.056)

(continued on next page)

TABLE 8 (continued)

Variable	Predicted Sign	Model (5a) Coefficient (p-value)	Model (5b) Coefficient (p-value)
MILLS	?	-0.565 (0.213)	-0.624 (0.207)
NEWMW	+	0.085 (0.351)	0.080 (0.360)
Pseudo R <sup>2</sup>		23.61%	23.68%
n		255	255

\*, \*\*, \*\*\* Denotes significance at the 0.10, 0.05, and 0.01 level, respectively.

Refer to Table 2 for variable definitions. p-values are one-tailed when directional predictions are made, and two-tailed otherwise.

### Equity Market Effects

Finally, we investigate the association between announcing the failure to remediate previously disclosed MWs and changes in stock prices. In untabulated univariate analyses, we find that the market reaction is not significantly different from zero using any of our measures.<sup>27</sup>

In untabulated multiple regressions, we find no consistent associations between stock price reactions and our measures of the pervasiveness of the weakness, the number of MWs that recur in Year 1, the initial Year 0 market reaction, earnings surprise, management intent to remediate, or the inverse Mills ratio (to proxy for the likelihood that the company will remediate). Overall, we find no evidence of a stock price reaction to the failure to remediate MWs.<sup>28</sup>

## CONCLUSION

Section 404 requires that accelerated filers publicly report the presence of MWs in their internal control systems. In this paper, we study a sample of companies that fail to remediate previously disclosed MWs and, thus, disclose *the same* weakness in two consecutive annual reports. We compare these companies to a control group of companies that initially disclosed MWs in internal control, but subsequently remediated these weaknesses. As such, we are able to focus on the determinants and consequences of the failure to remediate previously disclosed MWs that are *over and above* those associated with the initial disclosure of MWs.

We find that companies are less likely to remediate previously disclosed MWs when weaknesses are more pervasive (i.e., when they are at the entity level or when there are more individual weaknesses), and when their operations are more complex (i.e., they have more

<sup>27</sup> Recall that we run analyses on the raw event day return, the size-adjusted event day return using the equally weighted market return for companies in the same market capitalization decile, and the size-adjusted event day return using the value-weighted market return for companies in the same market capitalization decile.

<sup>28</sup> Note that the news about internal control weaknesses disclosed under Section 302 had a relatively small effect on stock prices, as documented in Beneish et al. (2008) and in Hammersley et al. (2008), and that Beneish et al. (2008) find no effect of internal control weaknesses disclosed under Section 404. Given this, our finding that there is not a significant stock price reaction to non-remediation may not be surprising. Note, however, that Dhaliwal et al. (2011) do find that the cost of debt is higher when companies disclose MWs under Section 404. Thus, our results are largely consistent with prior literature. In addition, we suggest that the credit markets may allow for a more powerful test of the effects of the failure to remediate MWs because credit ratings change less frequently than stock prices, so any effect may be easier to isolate.



TABLE 9

The Association between the Non-Remediation of Previously Disclosed Material Weaknesses and Changes in Credit Ratings and Interest Rates

Panel A: The Association between the Non-Remediation of Previously Disclosed Material Weaknesses and Changes in Credit Ratings

$$\begin{aligned}
 CHG(CREDIT\_RATING)_{it} = & \beta_0 + \beta_1 NON-REMIATOR_{it} + \beta_2 ENTITY\_LEVEL\_MW_{it-1} \\
 & + \beta_3 NUM\_MW_{it-1} + \beta_4 BIG4_{it} + \beta_5 TENURE_{it} \\
 & + \beta_6 LOG(AGE)_{it} + \beta_7 ZSCORE_{it} + \beta_8 LEVERAGE_{it} + \beta_9 SIZE_{it} \\
 & + \beta_{10} STD\_OCF_{it} + \beta_{11} NUMEST_{it} + \beta_{12} CHG(BIG4)_{it} \\
 & + \beta_{13} CHG(TENURE)_{it} + \beta_{14} CHG(LOG(AGE))_{it} \\
 & + \beta_{15} CHG(ZSCORE)_{it} + \beta_{16} CHG(LEVERAGE)_{it} \\
 & + \beta_{17} CHG(SIZE)_{it} + \beta_{18} CHG(STD\_OCF)_{it} \\
 & + \beta_{19} CHG(NUMEST)_{it} + \beta_{20} MILLS_{it} + \beta_{21} NEWMW_{it} \\
 & + \varepsilon_{it}.
 \end{aligned} \tag{6a}$$

$$\begin{aligned}
 CHG(CREDIT\_RATING)_{it} = & \beta_0 + \beta_1 NON-REMIATOR_{it} + \beta_2 ENTITY\_LEVEL\_MW_{it-1} \\
 & + \beta_3 NUM\_MW_{it-1} \\
 & + \beta_4 NON-REMIATOR_{it} * ENTITY\_LEVEL\_MW_{it-1} \\
 & + \beta_5 NON-REMIATOR_{it} * NUM\_MW_{it-1} + \beta_6 BIG4_{it} \\
 & + \beta_7 TENURE_{it} + \beta_8 LOG(AGE)_{it} + \beta_9 ZSCORE_{it} \\
 & + \beta_{10} LEVERAGE_{it} + \beta_{11} SIZE_{it} + \beta_{12} STD\_OCF_{it} \\
 & + \beta_{13} NUMEST_{it} + \beta_{14} CHG(BIG4)_{it} + \beta_{15} CHG(TENURE)_{it} \\
 & + \beta_{16} CHG(LOG(AGE))_{it} + \beta_{17} CHG(ZSCORE)_{it} \\
 & + \beta_{18} CHG(LEVERAGE)_{it} + \beta_{19} CHG(SIZE)_{it} \\
 & + \beta_{20} CHG(STD\_OCF)_{it} + \beta_{21} CHG(NUMEST)_{it} + \beta_{22} MILLS_{it} \\
 & + \beta_{23} NEWMW_{it} + \varepsilon_{it}.
 \end{aligned} \tag{6b}$$

Variable	Predicted Sign	Model (6a) Coefficient (p-value)	Model (6b) Coefficient (p-value)
Intercept	?	-1.018 (0.403)	-0.726 (0.546)
NON-REMIATOR	+	0.399 (0.165)	0.551 (0.127)
ENTITY_LEVEL_MW	+	1.569* (0.081)	0.838 (0.254)
NUM_MW	+	-0.125 (0.909)	-0.129 (0.881)
NON-REMIATOR * ENTITY_LEVEL_MW	+		3.288** (0.037)
NON-REMIATOR * NUM_MW	+		-0.035 (0.607)
BIG4	-	-1.124** (0.018)	-1.083** (0.019)
TENURE	-	-0.004 (0.404)	-0.008 (0.291)

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TABLE 9 (continued)

Variable	Predicted Sign	Model (6a) Coefficient (p-value)	Model (6b) Coefficient (p-value)
LOG(AGE)	–	0.326 (0.949)	0.327 (0.955)
ZSCORE	–	–0.012 (0.459)	–0.033 (0.387)
LEVERAGE	+	–0.228 (0.628)	–0.288 (0.665)
SIZE	–	0.237 (0.955)	0.226 (0.952)
STD_OCF	+	–2.894 (0.716)	–3.327 (0.751)
NUMEST	–	0.004 (0.527)	0.017 (0.609)
CHG(BIG4)	–	1.031 (0.707)	1.057 (0.718)
CHG(TENURE)	–	–0.090 (0.405)	–0.101 (0.392)
CHG(LOG(AGE))	–	2.134 (0.931)	1.861 (0.910)
CHG(ZSCORE)	–	0.362 (0.914)	0.379 (0.929)
CHG(LEVERAGE)	+	11.003*** ( $<0.001$ )	13.152*** ( $<0.001$ )
CHG(SIZE)	–	–1.648*** ( $<0.001$ )	–1.278*** (0.009)
CHG(STD_OCF)	+	10.035 (0.282)	10.585 (0.264)
CHG(NUMEST)	–	–0.069 (0.157)	–0.084 (0.105)
MILLS	?	0.506 (0.422)	0.248 (0.697)
NEWMW	+	0.126 (0.163)	0.074 (0.279)
Adjusted R <sup>2</sup>		65.68%	68.22%
n		57	57

**Panel B: The Association between the Non-Remediation of Previously Disclosed Material Weaknesses and Changes in Interest Rates**

$$\begin{aligned}
 CHG(INT\_RATE)_{it} = & \beta_0 + \beta_1 NON-REMIATOR_{it} + \beta_2 ENTITY\_LEVEL\_MW_{it-1} \\
 & + \beta_3 NUM\_MW_{it-1} + \beta_4 BIG4_{it} + \beta_5 TENURE_{it} + \beta_6 LOG(AGE)_{it} \\
 & + \beta_7 ZSCORE_{it} + \beta_8 LEVERAGE_{it} + \beta_9 SIZE_{it} + \beta_{10} STD\_OCF_{it} \\
 & + \beta_{11} NUMEST_{it} + \beta_{12} CHG(BIG4)_{it} + \beta_{13} CHG(TENURE)_{it} \\
 & + \beta_{14} CHG(LOG(AGE))_{it} + \beta_{15} CHG(ZSCORE)_{it} \\
 & + \beta_{16} CHG(LEVERAGE)_{it} + \beta_{17} CHG(SIZE)_{it} + \beta_{18} CHG(STD\_OCF)_{it} \\
 & + \beta_{19} CHG(NUMEST)_{it} + \beta_{20} MILLS_{it} + \beta_{21} NEWMW_{it} + \varepsilon_{it}. \quad (6c)
 \end{aligned}$$

(continued on next page)

TABLE 9 (continued)

$$\begin{aligned}
 CHG(INT\_RATE)_{it} = & \beta_0 + \beta_1 NON-REMIATOR_{it} + \beta_2 ENTITY\_LEVEL\_MW_{it-1} \\
 & + \beta_3 NUM\_MW_{it-1} \\
 & + \beta_4 NON-REMIATOR_{it} * ENTITY\_LEVEL\_MW_{it-1} \\
 & + \beta_5 NON-REMIATOR_{it} * NUM\_MW_{it-1} + \beta_6 BIG4_{it} + \beta_7 TENURE_{it} \\
 & + \beta_8 LOG(AGE)_{it} + \beta_9 ZSCORE_{it} + \beta_{10} LEVERAGE_{it} + \beta_{11} SIZE_{it} \\
 & + \beta_{12} STD\_OCF_{it} + \beta_{13} NUMEST_{it} + \beta_{14} CHG(BIG4)_{it} \\
 & + \beta_{15} CHG(TENURE)_{it} + \beta_{16} CHG(LOG(AGE))_{it} \\
 & + \beta_{17} CHG(ZSCORE)_{it} + \beta_{18} CHG(LEVERAGE)_{it} + \beta_{19} CHG(SIZE)_{it} \\
 & + \beta_{20} CHG(STD\_OCF)_{it} + \beta_{21} CHG(NUMEST)_{it} + \beta_{22} MILLS_{it} \\
 & + \beta_{23} NEWMW_{it} + \varepsilon_{it}.
 \end{aligned}
 \tag{6d}$$

Variable	Predicted Sign	Model (6c) Coefficient (p-value)	Model (6d) Coefficient (p-value)
Intercept	?	-0.012 (0.547)	-0.018 (0.386)
NON-REMIATOR	+	0.013** (0.036)	0.020** (0.022)
ENTITY_LEVEL_MW	+	0.015 (0.160)	0.015 (0.219)
NUM_MW	+	0.001 (0.320)	0.003 (0.116)
NON-REMIATOR * ENTITY_LEVEL_MW	+		-0.013 (0.656)
NON-REMIATOR * NUM_MW	+		-0.003 (0.821)
BIG4	-	-0.010 (0.115)	-0.009 (0.131)
TENURE	-	0.000 (0.441)	0.000 (0.499)
LOG(AGE)	-	0.003 (0.746)	0.003 (0.725)
ZSCORE	-	0.001 (0.811)	0.001 (0.811)
LEVERAGE	+	-0.001 (0.521)	0.000 (0.507)
SIZE	-	0.002 (0.754)	0.002 (0.747)
STD_OCF	+	-0.014 (0.611)	-0.013 (0.600)
NUMEST	-	0.000 (0.460)	0.000 (0.490)
CHG(BIG4)	-	0.002 (0.569)	0.004 (0.618)
CHG(TENURE)	-	-0.002* (0.077)	-0.002* (0.063)
CHG(LOG(AGE))	-	0.000 (0.494)	0.001 (0.511)
CHG(ZSCORE)	-	0.002 (0.954)	0.002 (0.952)

(continued on next page)

TABLE 9 (continued)

Variable	Predicted Sign	Model (6c) Coefficient (p-value)	Model (6d) Coefficient (p-value)
CHG(LEVERAGE)	+	0.019 (0.276)	0.018 (0.282)
CHG(SIZE)	-	-0.004 (0.264)	-0.005 (0.225)
CHG(STD_OCF)	+	0.032 (0.363)	0.021 (0.410)
CHG(NUMEST)	-	0.000 (0.441)	0.000 (0.467)
MILLS	?	-0.007 (0.372)	-0.005 (0.525)
NEWMW	+	0.003 (0.160)	0.003 (0.110)
Adjusted R <sup>2</sup>		2.51%	2.92%
n		149	149

Refer to Table 2 for variable definitions. p-values are one-tailed when directional predictions are made, and two-tailed otherwise.

segments or foreign operations). In addition, companies with smaller audit committees are less likely to remediate.

We also find that non-remediating companies suffer a number of adverse consequences. Relative to companies that remediate their previously disclosed MWs, they experience greater increases in audit fees the greater the number of MWs, they are more likely to receive modified and going-concern audit opinions (especially when MWs are at the entity level), and they are more likely to experience an auditor resignation the greater the number of MWs. They are also more likely to miss filing deadlines. Finally, they experience increases in credit ratings (indicating lower perceived credit quality) when MWs are more pervasive, and experience increases in the cost of debt capital, on average.

These findings should be of interest to regulators and to financial statement users as they consider the importance of remediating MWs. They should also aid managers who must make cost-benefit decisions about whether to invest resources in the remediation of MWs.

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