

Material Weaknesses Remediation and Earnings Quality: A Detailed Examination

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ABSTRACT

This paper investigates remediation of Sarbanes-Oxley Section 404 material weaknesses (MW) at a detailed level. Specifically, we examine variation in remediation rates by specific type of MW, and the association of improvement in earnings quality with remediation of specific MW types. Prior research examines remediation of all MW or broad categories of MW. However, studies have not yet shown which of the various types of MW within those broad categories are more difficult to remediate, and which are most influential in earnings quality. This inquiry is important in providing information to audit academics and practitioners on areas of greatest risk. We find that remediation lags for MW in entity-level areas of training, information technology and year-end adjustments, and in account-specific areas of revenue and taxes. We also find that remediation of MW in areas such as information technology, segregation of duties, tax, revenue, inventory and receivables, is associated with immediate improvement in earnings quality as measured by change in abnormal accruals. These findings build on prior research by enhancing our understanding of the relationship between internal control over the financial reporting function and the quality of accounting numbers used by financial markets.

Key words: Sarbanes-Oxley Section 404, Internal control, Material weakness, Remediation

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1. INTRODUCTION

This paper investigates remediation of specific types of Sarbanes-Oxley (SOX) Section 404 material weaknesses in internal control over financial reporting, with two purposes.¹ First, we build on prior research that considers full remediation of all previously disclosed MW, or full remediation of broad categories of MW (e.g., Goh 2009; Johnstone et al. 2009), by examining remediation at the level of specific MW type. This detailed look at remediation is important because companies disclose many types of control problems under Section 404, which likely vary in remediation difficulty as well as in their impact on the financial reports. Because the goal of Section 404 is to improve corporate financial reporting, it is important to identify specific areas in which control problems are more or less tractable and influential. Second, we examine which types of MW have greater impact on earnings quality when remediated. In so doing, we build on prior research (Ashbaugh-Skaife et al. 2008) that examines whether full remediation is associated with improvement in unexpected accruals. Overall, the goal of this study is to drill down to a finer level of specificity in examining how companies improve their controls under Section 404, and whether that improvement is apparent in earnings quality changes. Such research is important in building an understanding of the benefits of Section 404.

¹ SOX Section 404 (U.S. Congress 2002) requires that companies and their auditors document and test ICFR, and publicly disclose any detected MW that remain unremediated at the balance sheet date. According to auditing standards in effect during our study period (Auditing Standard No. 2, PCAOB (2004)), identified Internal Control Deficiencies (ICD's) that are unremediated at the balance sheet date are classified by severity, based on the likelihood of failing to prevent or detect a financial misstatement, and the materiality of likely misstatements. Of those, only material weaknesses not remediated by the balance sheet date are required to be publicly disclosed. Management must provide an assertion regarding ICFR effectiveness and the auditor presents a separate opinion on ICFR effectiveness. The conclusion on these reports must be "ineffective" if any material weaknesses are reported. Material weaknesses are those deficiencies judged to have a "more than remote likelihood that a material misstatement of the annual or interim financial statements will not be prevented or detected". AS No. 2 was superseded by AS No. 5 (PCAOB 2007), which changed the wording of the likelihood standard to "reasonably possible", but was not intended to change the meaning of that standard.

Our study differs from prior related research by studying a relatively finer classification of the nature of MW. Relative to our first purpose, most prior research examines full remediation at the company level, measured as disclosure of at least one MW in a given year (under Section 302 or 404), followed by a subsequent Section 404 report of effective controls. Using this measurement method, a company has to address all of its reported material weaknesses in order to be included in the “remediated” sample. Full remediation provides a public signal that all MW have been resolved, and thus enables market participants to know that companies have improved all of their controls as a result of the Section 404 process. However, to the extent that some MW are remediated but others are not, the full remediation method understates the benefit of SOX 404 in reducing financial reporting risk. Under the full remediation method, companies remediating some but not all MW are indistinguishable from companies that made no progress at all in improving their controls. Other research investigates remediation of broad groups of MW such as general or entity-level (Goh 2009) or COSO categories (Johnstone et al. 2009). However, no study yet provides a comprehensive analysis of rates of remediation by specific MW type.

Our second purpose is to investigate which types of MW have greater influence on earnings quality, by associating remediation of specific problem type with reductions in unexpected accruals. Ashbaugh-Skaife et al. (2008) find limited evidence of reduction in unexpected accruals for companies that fully remediate prior MW relative to those with continuing clean opinions (i.e., a marginally significant difference for one of two accruals measures used). We extend their analysis by focusing only on companies with ineffective controls (comparing effects of remediation within companies with prior MW disclosure), using a detailed classification of MW types, a longer sample period, and a more inclusive sample of public companies.

Our data comprise information on a panel of 676 companies from 2004 to 2006, with at least one MW reported in 2004 or 2005, and complete data on all variables. Our models are estimated at the level of the individual MW type, clustering on company and year to control for lack of independence within multiple MW types for the same firm/year. Our method requires tracing of individual MW types across years. Using MW classifications from *AuditAnalytics*, we first determined which types were repeated in successive years (2004 to 2005, and 2005 to 2006). For those types appearing in successive years, we then manually coded MW types from text descriptions in auditor and management Section 404 reports to determine whether specific control problems described in a given year recurred or were remediated. About 72 percent of sample companies remediated all MW, leaving 28 percent that remediated some but not all of their MW in the following year.

Addressing our first research question, we estimate the likelihood of remediating specific MW types, controlling for company characteristics that prior research shows are associated with MW disclosure. Results of these models reveal lower remediation likelihood for some specific entity level problems (i.e., documentation, year-end adjustments, training, reconciliations, information technology, segregation of duties and non-routine entries), and some account-specific problems (i.e., in taxes, revenue, liability accruals and inventory).

We next investigate the association of MW remediation with earnings quality by examining the linkage of specific MW type remediation with change in the absolute value of abnormal accruals. We find that fully remediating companies have significantly improved earnings quality relative to companies with continuing ineffective controls. Using the specific MW type variables, we find that remediation of some MW types is associated with significant improvement in earnings quality. These include entity-level problems in documentation,

information technology and segregation of duties, as well as account-specific problems in tax, revenue, inventory, and receivables accounts. These results suggest that financial statement users can adopt a more granular view of remediation, inferring that successful remediation of some specific MW can be a signal of improvement in the quality of disclosed financial information even if other MW remain unremediated.

These results provide several contributions to auditing research and practice. First, our results reveal that a significant amount of remediation activity is not detected by considering full remediation at the company level. Our detailed analysis of specific types of MW provides knowledge that certain MW have lagged in remediation, which should motivate companies to commit more resources and effort immediately after the discovery of such problems, in order to be able to remediate them in a timely manner. Similarly, auditors should apply professional skepticism to examine client assertions of successful remediation of such problems, perhaps applying more control testing in those areas. Our results could also benefit non-accelerated filer companies in the Section 404(a) process, and also potentially in Section 404(b).² These companies can choose to invest more resources up front in areas of internal controls that have proved to be harder to mend. Lastly, our results imply that investors could benefit from examining Section 404 disclosures more closely, to determine whether remediation of certain types of problems has occurred. However, as we discuss in the closing section of the paper, current disclosure practices make it difficult to determine whether specific MW are repeated from a prior year, or whether there is an occurrence of a new problem. Improvement in the organization of MW disclosures would benefit investors and other stakeholders in this regard.

² As of this writing, implementation of Section 404(b) among non-accelerated filers has been delayed by the SEC until after June 15, 2010.

The remainder of the paper proceeds as follows. Section II describes the background of this study, sets its contribution in the context of prior research, and develops our research hypotheses. Section III discusses the study's methods, and Section IV contains results of models and supplementary analyses. Section V presents the study's conclusions and limitations.

II. BACKGROUND AND PRIOR RESEARCH

Internal control weaknesses have been frequently cited as a proximate cause of fraud and business failure (e.g., the Cohen Commission 1978; COSO 1992). Aimed at improving the quality of financial reporting following the large-scale corporate failures of the early 2000's, SOX contains two provisions related to internal controls. Section 302 requires quarterly reporting by management of all public companies on the effectiveness of disclosure controls, along with CEO and CFO certification of the accuracy of the financial reports.³ Section 404 requires managements of "accelerated filers" (large public companies) and external auditors to document and test internal controls over financial reporting. The external auditor must then present an opinion as to the effectiveness of those controls, and to disclose any MW in internal control over financial reporting (ICFR) that remain unremediated at year-end.⁴

This study addresses two research questions. First, which types of MW are more difficult to remediate? Second, which types of MW remediation are most associated with earnings quality? Regarding the first of these questions, prior research examines factors associated with disclosures of Sections 302 and 404 MW and their subsequent remediation. These studies show that MW disclosures are associated with higher risk, operating complexity, company size and

³ Section 302 specifically requires company management to report significant changes in internal control affecting the quality of financial disclosures, which in practice means that identified MW are disclosed (Leone 2007). While Sections 404 and 302 differ somewhat in the nature of the controls affected, the most important procedural difference is that auditors are not required to assess or test internal controls under Section 302.

⁴ The original SEC guidelines in Regulation 12b-2 define accelerated filers as companies that have at least \$75 million of common equity float, have filed at least one 10-K, are subject to the Exchange Act for at least 12 months, and do not qualify as a small business under SEC rules.

resource constraints (e.g., Ashbaugh-Skaife et al. 2007; Doyle et al. 2007a), as well as lower quality of corporate governance (Zhang et al. 2007; Hoitash et al. 2009). Relatively fewer studies examine MW remediation. Goh (2009) finds that, among companies with ineffective controls under Section 302, those that fully remediate reported MW in a timely manner (as judged by a subsequent clean Section 404 opinion) are more financially healthy and have better corporate governance. Johnstone et al. (2009) find that remediation is associated with improvements in audit committee influence, competence and incentives, as well as differences in characteristics of boards of directors. Hammersley et al. (2009) also investigate complete remediation finding that lack of MW remediation is associated with higher audit fees, lower bond ratings, increased likelihood of receiving a going concern opinion, missing filing deadlines and more frequent auditor resignations. Chan et al. (2009) investigate factors associated with complete remediation and find that remediation is more likely in complex companies in terms of segments, companies with greater financial resources, who are audited by Big 4 auditors and when the audit committee hold more frequent meetings.

The current research differs from these studies in several ways. First, we investigate remediation of specific types of MW, instead of full remediation.⁵ Our MW type variables include a number of indicators for specific entity-level problems, as well as a number of indicators for specific accounts problems. This is important because prior research does not distinguish remediation likelihood by problem type, thus indicating which types are more difficult to fix. The implication of failure to remediate specific problem types is that if unremediated, they potentially affect financial reporting for a longer period. Further, there is a measurement error in the full remediation approach. Companies that partially remediate their

⁵ This approach necessitates tracing specific MW types across years. Our process for accomplishing this tracing, which involves reading SEC filings and using multiple independent coders, is outlined in the Methods section.

MW (i.e., some of a company's multiple problems are fixed while others are not) are classified as not fully remediated, despite some progress in that regard.

Some studies partially address this issue by examining full remediation of certain board categories of problems. For instance, Goh (2009) finds that companies having at least one "severe" MW (i.e., related to either "macro-level controls" in the control environment or the overall financial reporting process; Moody's 2004; Doyle et al. 2007b) are slower to fully remediate their problems. Johnstone et al. (2009) divide MW into the five broad COSO categories, estimating models of factors affecting full remediation *within* each category. Thus, prior research does not address remediation at the level of the specific control type. In contrast, we examine whether there are differences in remediation rates across specific types of MW, with company characteristics controlled in the model.

Our second research question asks whether, among companies previously reporting ineffective controls, earnings quality is relatively more improved by remediation of certain types of MW. This line of inquiry is important because the association of remediation with earnings quality provides one measure of the benefits of specific remediation efforts in improving financial reporting. Our study is closest to Ashbaugh-Skaife et al. (2008), who examine companies with MW disclosures made under Section 302 or 404. They show that companies with full remediation of Section 404 MW have marginally reduced absolute value of total unexpected accruals relative to those with effective controls, but not unexpected working capital accruals. We build on the Ashbaugh-Skaife et al. (2008) study by first investigating the association of improvement in earnings quality with full remediation in a larger, more recent sample of companies disclosing MW under Section 404. We then extend this line of research by testing which specific types of MW are associated with reduction in unexpected accruals. Prior

research has not addressed this issue. In the following section, we outline the methods used to undertake these analyses.

III. METHOD

Data and Variable Definitions

We obtain data on reported ICFR Section 404 MW in fiscal years 2004-2006 from the *AuditAnalytics* (AA) database. We gather auditor information from AA, financial data from Compustat and institutional ownership from Thomson Financial. We first identify 834 companies that reported MW in 2004 or 2005. To determine whether MW disclosed in a given year are repeated in the following year, we require panels of data from the same companies across two reporting years. Thus, we eliminate 104 observations that do not appear in successive years. We eliminate 54 additional observations with missing financial information. Our final sample consists of 676 observations that reported Section 404 MW in either 2004 or 2005, representing 595 companies.

AA analyzes Section 404 disclosures and classifies problems into codes. Table 1 defines the problem types and shows the frequency of each in our sample.⁶ To measure remediation, we examine whether a specific type of MW appearing in one year (2004 or 2005) was remediated or repeated in the following year (2005 or 2006, respectively). The first step in coding was to determine from AA data which individual classifications from 2004 recurred in 2005 (and from 2005 recurred in 2006) and which did not. Of the 676 companies with MW in 2004 or 2005, 187 had at least one problem category that recurred in 2005 or 2006. Because a problem classification may occur in successive years due to a different specific issue (e.g., a tax problem may be due to lack of expertise in foreign taxes in one year, and deferred tax asset valuation in

⁶ In coding whether a financial restatement in 2005 is due to the same issue in 2004, we decided not to include quarterly restatements in 2005 as recurring, because Section 404 reports are an annual event.

the next year), we read the text of Section 404 filings and hand-coded each recurring classification as to whether the MW was due to the same specific issue each year.

Insert Table 1 About Here

Our procedures for coding MW remediation were as follows. In a practice round consisting of four companies with 15 recurring classifications, the authors independently coded the recurring classifications as remediated, not remediated, or partially remediated. (The latter category is necessary because some classifications contain multiple specific issues.) Two factors reduced initial agreement among the coders in the practice round. First, some MW are complex, affecting multiple accounts. We checked for recurrence of each component of these complex MW, and coded remediation as “partial” if some components recurred and others did not.⁷ Second, because there is not a one-for-one match between the MW and the AA classifications, it is sometimes unclear which of the individual aspects of a MW are coded by AA in a specific classification. We discussed differences between coders, refined our coding rules, and recoded a sample of 16 companies (68 problems), with 96 percent agreement. The authors divided the remaining problems and coded them individually.

In addition to specific problem types, our models include control variables for company characteristics found by prior research to be associated with MW disclosure, such as size, financial health and complexity (e.g. Ashbaugh-Skaife et al., 2007; Doyle et al., 2007a; Zhang et al., 2007; Hoitash et al. 2009). These variables are defined in Table 2. We include *LNASSETS* (the natural logarithm of the company’s total assets), as prior research (e.g. Doyle et al. 2007b) finds that larger companies are less likely to disclose MW. We expect that larger companies, which typically have greater resources, will be more likely to remediate their problems.

⁷ There were relatively few “partial” remediations (2.7 percent overall). In the tabled models, we consider partially remediated MW as fully remediated. Our results are not sensitive to classifying partially remediated MW as not remediated.

Insert Table 2 About Here

We also control for company complexity by including *FOREIGN_SUBS*, an indicator variable equal to one for companies with foreign operations; zero otherwise. Complexity of internal control problems is measured using *MULTIPLE*, an indicator variable equal to one if the number of areas affected by the MW is greater than the sample mean; zero otherwise. We expect that increasing complexity will reduce remediation likelihood; thus, we expect negative signs on these variables. We control for client financial health by including *LOSS*, an indicator variable equal to one for companies reporting losses in the previous or current year, zero otherwise, and *LEVERAGE*, the ratio of total liabilities to total assets. We expect lower remediation likelihood among companies with poor financial health. We control for external monitoring by including *INSTITOWN*, measured as the percentage of stocks held by institutional investors; and *REGULATED*, an indicator variable that equals one if the company is in a regulated industry; zero otherwise.⁸ We expect a positive sign on both variables, as greater oversight will increase incentive to remediate MW.

We control for auditor size by including an indicator variable *BIG6*, which equals one for the largest six audit firms; zero otherwise.⁹ We expect a positive sign on this variable in the remediation models, as the larger audit firms are more experienced and have greater reputation concern. We also control for various types of auditor changes in two different ways. We first control for the reason of the change with *CHANGE_SAME_TIER*, (an indicator variable equal to one if the company has changed auditor within the same size tier level; zero otherwise), *CHANGE_DOWN* (an indicator variable equaling one if the company has changed to a lower

⁸ The regulated industries are Financials, with two-digit SIC code between 60-69, and Utilities, with two-digit SIC code of 49.

⁹ The largest six audit firms include KPMG, Deloitte, Ernst & Young, PricewaterhouseCoopers, BDO Seidman and Grant Thornton.

size tier auditor; zero otherwise) and *CHANGE_UP* (an indicator variable equaling one if the company has changed to a higher size tier auditor; zero otherwise). We expect a negative sign associated with change to a larger auditor, and a positive sign with change to a smaller auditor, with the sign of same-tier changes indeterminate.

We also control for the type of auditor change using alternative measures based on whether the change is the client's or auditor's choice. *DISMISSED* is an indicator variable that equals one if the auditor was dismissed from the engagement; zero otherwise. We expect a positive sign on this variable, as companies might seek a new auditor who will give a clean Section 404 opinion. Similarly, *RESIGNED* is an indicator variable that equals one if the auditor resigned from the engagement; zero otherwise. We expect a negative sign on *RESIGNED*, as greater care may be taken by the successor auditor due to the signal of client risk.

Remediation Models

Our remediation models contain two dependent variables that differ in granularity. The dependent variable of Model (1) is *FULL_REMEDIATION*, which measures remediation at the company level. This is an indicator variable equal to one if a company has remediated all of its reported MW; zero otherwise. Our second dependent variable, *PROBLEM_REMEDIATION*, measures remediation at the specific problem type level. This is an indicator variable equal to one if a specific type of MW was remediated; zero otherwise. The model explaining *PROBLEM_REMEDIATION* is estimated at the level of the individual control; i.e., each observation is a control of a specific type that is/is not remediated. Because in model (1) each company can appear in the sample more than once, and in model (2) some companies have multiple MW, we estimate both models using clustering at the firm level, producing Huber-White robust standard errors. Additionally, to control for year fixed effects, we use the indicator variable *FY_2006*.

Our logistic regression models take the following form:

$$\begin{aligned}
 FULL_REMEDICATION = & \beta_0 + \beta_1 LNASSETS + \beta_2 FOREIGN_SUBS + \beta_3 MULTIPLE + \beta_4 LOSS + \beta_5 LEVERAGE + \beta_6 INSTITOWN + \beta_7 REGULATED + \beta_8 BIG6 \\
 & + \beta_9 CHANGE_SAME_TIER + \beta_{10} CHANGE_DOWN + \beta_{11} CHANGE_UP \\
 & + \beta_{12} FY_2006 + e.
 \end{aligned} \quad (1)$$

$$\begin{aligned}
 PROBLEM_REMEDICATION = & \beta_0 + \beta_1 DOCUMENTATION + \beta_2 YE_ADJUSTMENTS + \beta_3 TRAINING + \beta_4 RECONCILIATIONS + \beta_5 IT + \beta_6 SEG_DUTIES + \beta_7 NONROUTINE + \beta_8 TAX + \beta_9 REVENUE + \beta_{10} LIAB_ACCRUAL \\
 & + \beta_{11} INVENTORY + \beta_{12} RECEIVABLE + \beta_{13} FIXED_INTANGIBLE + \beta_{14} LNASSETS + \beta_{15} FOREIGN_SUBS + \beta_{16} MULTIPLE + \beta_{17} LOSS \\
 & + \beta_{18} LEVERAGE + \beta_{19} INSTITOWN + \beta_{20} REGULATED + \beta_{21} BIG6 \\
 & + \beta_{22} CHANGE_SAME_TIER + \beta_{23} CHANGE_DOWN + \beta_{24} CHANGE_UP \\
 & + \beta_{25} FY_2006 + e.
 \end{aligned} \quad (2)$$

We also re-estimate these models substituting *DISMISSED* and *RESIGNED* for the audit firm size tier change variables.

Earnings Quality Models

We next investigate the association of remediation of specific types of MW with improvement in earnings quality. To measure earnings quality, we compute unexpected (abnormal) accruals using measures standard to the accounting literature. Particularly, we use a variant of the original Jones (1991) accrual estimation model modified by Dechow et al. (1995) augmented with a control for performance (Kothari et al. 2005). We estimate α_1 , α_2 , and α_3 from the model below by running cross-sectional regressions for each year and two-digit SIC code among accelerated filers:

$$TACC = \alpha_1(1/TA_{t-1}) + \alpha_2(\Delta REV_t) + \alpha_3(PPE_t) + \varepsilon_t$$

TACC is total accruals and is measured as the difference between net income (Compustat data item 172) and cash flow from operations (data item 308), TA_{t-1} is lagged total assets, ΔREV_t is the change in revenues from year t to year $t-1$, ΔREC_t is the one year change in receivables, and PPE_t is the gross property plant and equipment. All variables are scaled by the lagged total

assets. The estimated coefficients from the above equation are used in the subsequent equation for the calculation of discretionary accruals (*DACC*) as the difference between total accruals and the expected level of accruals. We use the absolute value of *DACC* termed as *ABSDACC* as our surrogate for earnings management.

$$DACC = TACC - \hat{\alpha}_1(1/TA_{t-1}) + \hat{\alpha}_2(\Delta REV_t - \Delta REC_t) + \hat{\alpha}_3(PPE_t)$$

We start our accrual estimation process by identifying all companies on Compustat with available data for years 2004-2006. Next, we eliminate firms with missing data as well as firms in industries with fewer than 20 observations required for each regression. In order to estimate the association of the remediation (or lack of remediation) of specific types of MW with the change in discretionary accruals, we require data in two consecutive years. Eliminating observations with missing data on discretionary accruals or control variables in model (3) below, or lack of matching company pairs between 2004 and 2005 or between 2005 and 2006, we obtain data on 468 firm-year observations for the change in accruals models.

Model 3 examines the association of remediation (or lack of remediation) of individual problem types with the change in accruals quality:

$$\begin{aligned} \Delta ABSDACC = & \beta_0 + \beta_{1-13} [type] + \beta_{14} \Delta LNASSETS + \beta_{15} LOSS + \beta_{16} ALEVERAGE + \beta_{17} \quad (3) \\ & \Delta CFO + \beta_{18} \Delta MTB + \beta_{19} EXTREME-GROWTH + \beta_{20} BIG6 + \beta_{21} LIT \\ & + \beta_{22} FY_2006 + e;^{10} \end{aligned}$$

Similar to Ashbaugh-Skaife et al. (2008), we measure the change in earnings quality as the change in the absolute value of the discretionary accruals from 2004 to 2005, or from 2005 to 2006 ($\Delta ABSDACC$)¹¹. We also compute within-firm differences of control variables shown by prior research to be associated with discretionary accruals, such as firm size, growth and risk

¹¹ Similarly to Ashbaugh-Skaife et al. (2008), we do not use the accrual noise measure developed by Dechow and Dichev (2002) because this measure is calculated over five to seven years, and thus year-to-year changes using this measure are averaged over a longer time period.

(e.g. Dechow et al. 1995, McNichols 2002 and Frankel et al. 2002). We use the change in the natural log of assets ($\Delta LNASSETS$) to control for size and we expect a positive sign. We control for risk with $\Delta LEVERAGE$, the change in cash flow from operations ΔCFO (Frankel et al. 2002), and companies who report negative income ($LOSS$) expecting a positive association between these variables and abnormal accruals. We also expect higher accruals among firms with high growth and growth potential, which we measure with the market to book ratio (ΔMTB) and extreme sales growth ($EXTREME-GROWTH$), an indicator that equals one if the year-on-year growth in sales is in the top quintile; zero otherwise. Furthermore, we expect that better monitoring by auditors will lead to lower abnormal accruals and therefore a negative association is expected for $BIG6$. Finally, we include control for companies with membership in industries more prone to litigation (LIT).

To measure the remediation of particular types of problems, we include a series of variables (shown as $[type]$ in Model 3) that indicate remediation of the specific problem types shown in Table 1.¹² Each variable accepts a value of one if the firm remediated that specific type of MW from one year to the next. For instance, if a firm had a tax problem during 2004 but did not report a similar problem in 2005, the variable TAX would accept the value of one; zero otherwise. In all models, we correct the standard errors for heteroscedasticity by clustering at the firm level and include indicator variables to control for industry and year fixed effects.

IV. RESULTS

Descriptive Statistics

Table 1 Column 1 shows descriptive statistics on the MW types within our sample, in order of decreasing frequency within entity-level (Panel A) and account-specific (Panel B)

¹² We include variables for each problem type with an average frequency of at least 50 problems per year in the sample period.

categories, respectively. Column 2 shows the percentage of each MW type that are remediated by the next Section 404 report, Column 3 presents the percentage of partially remediated MW and Column 4 presents the percentage of unremediated MW. Of the 4,419 disclosed MW types, 11.6 percent are not remediated after a year, 2.7 percent are partially remediated and the remaining 85.7 percent are remediated. The most frequent entity-level MW reported in our sample period is *DOCUMENTATION* (14.7 percent of the sample), which AA defines as a broad category that includes any internal control problem associated with failure to justify an account balance. Problems with control over year-end adjustments are the next most frequent entity-level MW type (8.2 percent), followed by problems with *TRAINING* (6.9 percent). Among account-specific MW, the most frequent are problems in *TAX* (5.0 percent), followed by *REVENUES* (4.3 percent) and accrued liabilities (3.8 percent).

The remediation rates differ considerably for specific types of MW disclosed in Table 1. The highest rates are for the categories of *EXPENSE_CAPITALIZATION* (100 percent) and *DEPRECIATION_ AMORTIZATION* (97.1 percent), both account-specific areas with relatively simple accounting rules. The lowest remediation rates are for the categories of information technology (*IT*; 73.8 percent) and *JOURNAL_ENTRY* (77.2 percent). Both of these are entity-level problem types, which are more pervasive and likely more difficult to correct (Moody's 2004). Model (2) tests relative remediation by problem type, using a multivariate model.

Table 2 shows descriptive statistics on company-level variables included as control variables in models (1) and (2), comparing means/percents between sample companies that did (72.3 percent) or did not (27.7 percent) remediate all previously disclosed MW. Regarding dichotomous variables, we note that 28.6 (60.4) percent of the companies remediating (not remediating) all their MW from the prior year had control problems spanning multiple areas.

This variable is significantly different between groups ($p < 0.01$), suggesting that remediation is less likely among companies whose MW are widespread across multiple areas. Losses are reported by 40.0 (56.7) percent of companies that did (did not) remediate all MW, also a significant difference ($p < 0.01$). Univariate statistics show that *FOREIGN_SUBS* operations ($p < 0.01$) are less prevalent among companies that remediate all of their problems (29.2 versus 44.9 percent), suggesting company complexity affects ability to remediate MW.

Of our sample companies, 88.8 (82.3) percent of remediating (nonremediating) companies are audited by one of the largest six auditing firms. The rate of audit firm dismissals of clients in our sample period is 8.2 (6.4 percent) for remediating (nonremediating) companies, while the rate of client resignations is 3.7 (5.9) percent. Of those auditor changes, most resulted in an auditor tier downgrade (6.3 versus 4.8 percent), while only 0.4 (1.1) percent were upgrades. There are no significant differences between remediating and nonremediating companies with respect to any of the auditor characteristics. Firms in regulated industries comprise 24.5 (11.2) percent of remediating (nonremediating) companies, a significant difference between groups ($p < 0.01$).

With respect to continuous variables, Table 2 shows that the mean natural log of total assets is marginally higher among companies that remediate all their MW (6.68 versus 6.40, $p < 0.10$).¹³ Mean leverage is 57.8 (60.6) percent among remediating (nonremediating) companies. While the percentage of institutional owners is 62.3 (61.0) for remediating (nonremediating) companies; this difference is not significant.

Results of Model (1): Full Remediation

¹³ The distribution of raw assets is highly skewed, as is commonly the case, indicating the need to log the values for inclusion in the models.

Table 3 shows results of estimating Model (1), which examines factors affecting the likelihood of full remediation of previously disclosed MW.¹⁴ We estimate two versions of Model (1): Column A shows results using variables indicating auditor changes by firm size tier, while Column B shows results using *DISMISSED* and *RESIGNED* to indicate the nature of auditor changes. Both models are well specified, with pseudo-R² of about 0.19. Our predictions are that remediation should be more likely among companies that are financially strong and less complex. Results in Column A show that full remediation is not affected by company size or leverage. However, *LOSS* is negative and significant ($p < 0.10$), as are *MULTIPLE* (indicating multiple areas affected by the MW) and *FOREIGN_SUBS* (indicating foreign operations), both at $p < 0.01$. These results replicate and extend the findings of Goh (2009) by showing that financial health and complexity factors affect the likelihood that companies fully remediate their MW.

Insert Table 3 about Here

Furthermore, we learn that companies in *REGULATED* industries are more likely to fully remediate their problems ($p < 0.01$), suggesting that greater remediation incentives or pressure contributes to remediation success. Since company resources are limited management might need to allocate the budget to high priority projects. It could be that the cost/benefit considerations for internal control investments stemming from potential regulatory sanctions as well as other penalties such as higher audit fees and lower bond ratings (Hammersley et al. 2009) are such that investments in internal control improvements are a priority for companies in regulated industries. Column A also shows that consistent with expectation, companies audited

¹⁴ To assess the extent of multicollinearity in our models, we use variance inflation factors (VIF) computed using OLS regression with the same dependent and independent variables. Our tests show that the highest VIF is 1.81 (for *BIG6*), which is well below the level suggestive of multicollinearity problems (Neter et al. 1996).

by *BIG6* audit firms are more likely to fully remediate their problems ($p < 0.05$). This suggests that larger audit firms audit better companies, and/or that those firms are more equipped to guide companies in the remediation process. Of the auditor change variables, the only significant coefficient is on *CHANGE_DOWN*, which is positive and marginal at $p < 0.10$. This suggests either that companies with less severe problems chose to switch to smaller firms, or that successor smaller firms have lower standards for what constitutes a MW.

Column B presents results of estimating Model (1) while measuring the nature of auditor changes measured as *DISMISSED* or *RESIGNED*. These measures do not contribute to explaining remediation likelihood, implying that the only association of auditor change with remediation is captured in Column A: companies moving to a smaller audit firm are more likely to remediate. Other results are similar to those of Model (1), with the exception of *LEVERAGE*, which has the expected negative sign in this model ($p < 0.10$).

Results of Model (2): Remediation of Specific Problem Types

Table 4 presents results of estimating Model (2), which examines the likelihood of remediating specific problem types (presented in order of decreasing frequency), while controlling for company and auditor characteristics. Both models are well specified, with pseudo- $R^2 = 0.149$. Results show that a number of the problem type variables have negative and significant coefficients, implying that they are less likely to be remediated within a year than are the insignificant types and other less frequent types that are in the intercept. Specifically, we find all entity-level problem types in the model to be significant at some level: *DOCUMENTATION*, *YE_ADJUSTMENTS*, *TRAINING*, *IT*, (all at $p < 0.01$); *SEG_DUTIES*, *RECONCILIATIONS*, (both at $p < 0.05$) and *NONROUTINE* (at $p < 0.10$).

Account-specific problem types with negative and significant coefficients include *TAX* and *REVENUE* (both at $p < 0.01$), *INVENTORY* ($p < 0.05$), and *LIAB_ACCRUAL* ($p < 0.10$). Thus, by count, more of the frequent entity-level problems are slow to be remediated, relative to account-specific problems. One plausible explanation for these results is that remediating entity-level problems usually requires a large investment over a long time period. Timing of activity is also a likely factor affecting remediation for year-end adjustment and taxes. Most of the activity in these areas takes place around or following the balance sheet date. Thus, if problems are found in the processes associated with making these entries, it is likely too late to fix them by the “as-of” balance sheet date (see also Graham and Bedard 2009). In the case of the taxes and revenues, complexity is an additional likely factor in making remediation difficult. Results on control variables are generally similar to those reported in Table 3, except that the coefficients on *REGULATED* and *CHANGE_DOWN* are no longer significant after including specific problem types in the model.

Insert Table 4 about Here

In sum, results of Model (2) provide insight into the relative likelihood of remediating specific types of MW. Several of the variables indicating specific types of MW are significant, suggesting they are more difficult to remediate. Entity-level problems also predominate among the types for which remediation is less likely. In the following section, we present results of models estimating the association of MW remediation with earnings quality.

MW Remediation and Earnings Quality

We next consider the association of MW remediation with improvement in earnings quality, using Model (3). Due to loss of data from computation of abnormal accruals, the sample used to estimate this model consists of 468 companies and 3,076 MW types. Panel A of Table 5

shows descriptive statistics for dependent and independent variables in the Model (3) sample. This table shows that the mean change in the absolute value of abnormal accruals is slightly negative at -0.09 percent. The mean change in assets from prior to current year is 6.3 percent. Just over half of the sample companies had a current year loss. Leverage increased slightly from prior to current year across the sample (0.2 percent). Cash flow from operations decreased slightly (0.1 percent). The mean change in market-to-book value is -19.5 percent. The percentage of companies with extreme growth (measured as the top quintile of year-on-year change in sales) is 15.4 percent. The largest six audit firms audited 88.8 percent of the sample. The percentage of companies in high litigation industries is 28.4 percent.

Panel B in Table 5 presents results of estimating Model (3), with earnings quality measured as the change in the absolute value of abnormal accruals in the remediation year. We first estimate Model (3) with a single variable indicating full remediation of all MW. Column (A) of Table 5 shows that *MW-REMEDIATION* is negative and significant ($p < 0.05$), implying that companies that remediate all MW have better financial reporting quality than those that continue to report Section 404 MW. This result is consistent with prior research (Ashbaugh-Skaife et al. 2007). The coefficient is also negative and significant at $p < 0.05$ when we substitute the proportion of problems remediated for the indicator variable *MW-REMEDIATION*.

Insert Table 5 About Here

We next investigate the role of remediation of specific types of MW in earnings quality by estimating Model (3) with the same set of MW type variables used in Model (2) (i.e., all those with a frequency of at least 100 in the two-year sample period). Results, presented in Column (B) of Table 5, show that of the specific types of MW included as variables in the model, there is an association of remediation with reduction in abnormal accruals for entity-level MW in categories

of *DOCUMENTATION* ($p < 0.05$) , *IT* ($p < 0.05$), and *SEG_DUTIES* ($p < 0.10$). In addition, several account-specific MW types have negative and significant coefficients: *TAX* ($p < 0.05$), *REVENUE* ($p < 0.05$), *INVENTORY* ($p < 0.05$) and *RECEIVABLE* ($p < 0.10$). Thus, relative to other types of MW, the remediation of these specific types has the strongest impact in improving earnings quality in the near term. Some specific accounts (i.e., taxes, revenue, and inventory) that are significant in this model are the also significant in Model (2). Thus, these accounting areas are likely complex, hindering ability to remediate, but companies that do remediate MW in those areas show an immediate reduction in abnormal accruals.

Integrating Findings on MW Type Frequency, Remediation Likelihood and Earnings Quality

The combination of the frequency analysis shown in Table 1 with the models of remediation likelihood (Table 4) and earnings quality change (Table 5), yields several categories into which the specific MW types can be placed. Table 6 summarizes the combined results. Column A shows the order of frequency of MW types within entity-level and account-specific categories. Columns B and C indicate the MW types found to be significant in the remediation likelihood and accruals models, respectively.

Insert Table 6 About Here

From the Table 6 summary, we highlight two groups of MW types. One group is shown in Column B to be more difficult to remediate, but Column C shows that remediation activity within these types to date has no detectable effect on earnings quality. These are year-end adjustments, training, reconciliations, non-routine and liability accruals. Four of the five are entity-level problems, and it may be that effects of their remediation take longer to show in earnings than is measured by our one-year window. The other group of MW types are those found to lag in remediation likelihood, but remediation to date shows a detectable improvement

in earnings quality. The entity-level problems in this group include documentation, information technology and segregation of duties. The latter two share an element of personnel reallocation, as the definition of information technology issues shown in Table 1 includes specific reference to segregation of duties (i.e., logical and physical access control). Remediating such a problem could involve hiring new workers, changing assignments or workflows, and thus could take more time than remediation of other problems. With regard to the documentation category, the meaning of its importance in accruals is unclear. As shown by the definition and frequency in Table 1, “documentation” is a broad category that could apply to many different kind of control problems. Without further breakdown, it is difficult to tell why these problems are both more difficult to remediate, and more likely to affect accrual quality, than other types of problems.

Table 6 also shows three types of account-specific problems that are both difficult to remediate and likely to affect accrual quality; i.e., those in the areas of taxation, revenue, inventory, and receivables. By surveying auditors about earnings management attempts by their clients, Nelson et al. (2002) find that such attempts are most frequently made in the areas of reserves and revenues. “Reserves” typically include general types of reserves such as valuation accounts on inventory and receivables. This corresponds to our findings, as does the high frequency of attempts to manage earnings through revenues. Presumably, more effective controls over those areas would prevent those attempts from occurring. Although Nelson et al. (2002) do not find earnings management attempts through taxation accounts to be frequent, the events recollected by the partners in their survey would have predated the controversy over tax non-audit services in the early 2000’s. According to Omer et al. (2006), tax non-audit services declined significantly over this period, even though those services were not specifically prohibited by the SEC. Thus, clients who had previously relied on the auditor to prepare their tax

accrual were now forced to rely on their own personnel to do this, or to hire a consultant with less expertise than the auditor. Improving controls over the tax function in our sample period should have helped in preventing both error and earnings management in the tax function.

In the following section, we summarize the limitations of our design, followed by a discussion of main conclusions and implications of our research.

V. LIMITATIONS AND CONCLUSIONS

This study investigates companies' success in remediating specific types of material weaknesses (MW) in internal control over financial reporting disclosed by companies in 2004 and 2005 under Section 404 of the Sarbanes-Oxley Act. We then relate remediation of specific problem types to improvement in earnings quality, as measured by reduction in the absolute value of abnormal accruals. This analysis is important because the objective of Section 404 is to improve financial reporting quality. While identification of MW is a key step on the road to fixing those control flaws, those problems that remain unremediated could continue to affect financial reporting quality into the following year. Thus controls improvement through remediation is a key step in achieving the goals of Section 404. Prior research has not investigated which specific types of MW are more difficult to remediate. Further, while Ashbaugh-Skaife et al. (2008) show that full remediation (i.e., going from an adverse to an unqualified SOX 404 opinion) is associated with improvement in earnings quality, prior research did not investigate whether remediation of some specific types of MW contribute more to that improvement than others. We address these issues by examining U.S. public companies with MW in 2004 and 2005, determining through hand-coding of SEC filings whether those companies reported the same problem again in the following year. Our reading of multiple disclosures by management and auditors highlights the need for a better structure that can allow

users of the financial statements to clearly perform year to year comparisons of internal control disclosures. Regulators could require companies to present numbered disclosures of individual MW in a given year. In subsequent years, firms could detail their success or lack of success, in remediating each of the numbered issues. This view is echoed by Moody's (2004): *"There are two areas where improved disclosure about controls would help creditors. First, companies with control problems could often be more specific about the nature of the control problems they report. Second, companies could be more specific about their plans to remediate control weaknesses and the timing for doing so."*

Our analyses yield several main findings. First, our models suggest greater difficulty in remediating entity-level MW, relative to account-specific MW. While other studies also find the entity-level category to be difficult to remediate, we show that this applies to all of the specific entity-level MW within our models. Further, our results also suggest that some account-specific types are important and should receive greater attention. These results have implication for both practice and research. From a practical point of view companies and auditors should be aware of which specific types of problems are hard to remediate. This knowledge can then assist managers in accomplishing efficient resource allocation directed towards the process of remediating these problems. On the research side, it is common to categorize problems into general (i.e., company-, or entity-level) problems and account-specific problems. However, our results suggest that a finer classification provides greater insight, as all general or account-specific problems are not created equal in terms of either remediation likelihood or impact on financial reporting. Therefore, in certain context of investigation, researchers should consider examining the types of MW disclosed rather than the aggregated form. This study shows that of the types of MW with sufficient frequency to be included as separate variables in our models, we find all entity-level

types to be significantly less likely to be remediated, compared with four of six account-specific types. Significant entity-level types in the remediation likelihood model include problems in documentation and year-end adjustments, inadequate training, problems in reconciliations, poor information technology controls, lack of segregation of duties and non-routine deficiencies. Account-specific MW types significant in this model include taxation, revenues, accrual of liabilities, and inventory. All of these accounts have complex components, and all three have year-end processes that could make it difficult to remediate within a year's time. For example, inventory could be counted only at the annual balance sheet date, and the annual tax accrual occurs only once a year. Thus while the design effectiveness could be assessed before year end, it is difficult for management and auditors to determine the operating effectiveness of controls in these areas until the following year-end.

While companies' differential ability to remediate certain types of problems is in itself interesting, it is important to examine whether remediation really improves financial reporting. We test this linkage by examining the association of remediation with change in earnings quality as measured by the difference in abnormal accruals from the year in which the MW is initially disclosed, to the subsequent year. While recognizing that this is a relatively short window, using a longer window introduces more opportunity for confounding variables to weaken the ability to attribute differences to remediation. Integrating our findings on MW type frequency, remediation likelihood, and earnings quality, we find that several more common entity-level and several account-specific types lag in remediation, but if remediated are more likely to yield short-term earnings quality improvement. These include documentation, information technology and segregation of duties (entity-level) and taxation, revenue, inventory, and receivables (account-specific). These results emphasize the importance of examination at the specific problem type.

While the literature often focuses on the entity-level versus account-specific dichotomy, our results reveal that a finer partition is more informative. As evident from our findings short-term improvement in earning quality is driven by remediating some general problems as well as some account-specific problems.

In sum, our study concentrates on the early years of compliance with Section 404 and the conclusions we draw are likely confined to this transitional stage. Future work can extend this analysis to additional periods and also examine the remediation likelihood and the link to earnings quality in a sample of non-accelerated filers. Non-accelerated filers have had a longer period of time to prepare for Section 404 (b) and the type of problems and remediation likelihood of these problems could change over time and with the general experience of internal control management.

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TABLE 1
Definitions of Material Variable Problem Types, Frequency of Occurrence and Percent Remediated

<i>Problem Type</i>	<i>Excerpts from AuditAnalytics Definitions</i>	<i>1. Frequency (Percent)</i>	<i>2. Percent Remediated</i>	<i>3. Percent Partially Remediated</i>	<i>4. Percent Unremediated</i>
A. Entity-level					
<i>DOCUMENTATION</i>	MW deriving from internal control systems that do not contain adequate documentation, policies or other means of justifying account balances.	651 (14.7%)	78.5	10.0	11.5
<i>YE_ADJUSTMENTS</i>	Circumstances where one of the explanations for a material weakness is the number and/or size of year-end adjustments.	364 (8.2%)	82.3	4.4	12.63
<i>TRAINING</i>	Problems with accounting personnel resources, competency, training, experience and/ or adequacy.	307 (6.9%)	82.4	1.6	16.0
<i>RECONCILIATIONS</i>	Inadequate account reconciliations identified as the reason for material or numerous adjustments.	187 (4.2%)	86.1	0.5	13.4
<i>IT</i>	Deficiencies in program controls, program implementation, segregation of duties with regard to access to computer records and related problems with oversight/access to electronic data/programs.	126 (2.9%)	73.8	0	26.2
<i>SEG_DUTIES</i>	Deficient controls over access to software, accounting or financial reporting records.	125 (2.8%)	83.2	0	16.8
<i>NONROUTINE</i>	Control deficiencies identified as non-routine by the registrant.	113 (2.6%)	85.8	0	13.2
<i>JOURNAL_ENTRY</i>	Deficiencies or issues associated with the journal entry process.	79 (1.8%)	77.2	2.5	20.3
<i>CONSOLIDATION</i>	Problems with consolidation ... including variable interest entities and off balance sheet arrangements.	58 (1.3%)	84.5	1.7	13.8
<i>FOREIGN_MW</i>	Foreign/related/affiliated subsidiary or party issues.	55 (1.2%)	83.6	1.8	14.5
<i>INTERCOMPANY</i>	Problems related to intercompany or affiliate balances, investment valuations or transactions.	42 (1.0%)	90.5	0	9.5

TABLE 1 (continued)
Definitions of Material Variable Problem Types, Frequency of Occurrence and Percent Remediated

<i>B. Account-specific</i>		<i>1. Frequency (Percent)</i>	<i>2. Percent Remediated</i>	<i>3. Percent Partially Remediated</i>	<i>4. Percent Unremediated</i>
<i>TAX</i>	Tax expense, benefit, deferral, or other issues, including FAS 109.	219 (5.0%)	78.5	2.3	19.2
<i>REVENUES</i>	Control deficiencies in approach, understanding or calculation associated with the recognition of revenue.	188 (4.3%)	79.8	1.1	19.1
<i>LIAB_ACCRUAL</i>	Problems associated with the accrual or identification of liabilities on the balance sheet.	169 (3.8%)	86.3	3.0	10.7
<i>INVENTORY</i>	Problems associated with transactions affecting inventory, vendor relationships (including rebates) and/or cost of sales.	164 (3.7%)	84.1	1.8	14.0
<i>RECEIVABLE</i>	Deficiencies with respect to cash, cash equivalents, accounts receivable, investments, notes, loans, and/or related reserves.	155 (3.5%)	87.7	2.6	9.7
<i>FIXED_INTANGIBLE</i>	Issues with calculation or valuation of property fixed or intangible assets.	112 (2.5%)	93.8	0.9	5.4
<i>LEASE</i>	A lease, leasehold or related issue has been identified with internal or financial reporting controls.	93 (2.1%)	94.6	2.2	3.2
<i>SUBSIDIARY</i>	Problems associated with disclosures about related, alliance, affiliated and/or subsidiary entities”.	85 (1.9%)	82.3	2.4	15.3
<i>DERIVATIVES</i>	Problems in approach, theory or calculation of derivative instruments.	70 (1.6%)	80.0	1.4	18.6
<i>FAS134</i>	Problems associated with FAS 5 type contingencies and commitments”.	70 (1.6%)	95.7	1.4	2.9
<i>DEPRECIATION_AMORTIZATION</i>	Problems associated with depreciation, amortization, or depletion of reserves.	68 (1.5%)	97.1	0	2.9
<i>ACQUISITION</i>	Problems in approach, theory or calculation associated with the merger, acquisitions, reorganization or disposal issues for registrants.	66 (1.5%)	94.9	0	6.1

TABLE 1 (continued)
Definitions of Material Variable Problem Types, Frequency of Occurrence and Percent Remediated

<i>B. Account-specific (continued)</i>		<i>1. Frequency (Percent)</i>	<i>2. Percent Remediated</i>	<i>3. Percent Partially Remediated</i>	<i>4. Percent Unremediated</i>
<i>EXPENDITURES_ CAPITALIZATION</i>	Problems in approach, theory or calculation associated with the capitalization of expenditures.	51 (1.2%)	100	0	0
<i>CASH_ CLASSIFICATION</i>	Problems manifested in cash flow statements that are not consistent with GAAP.	50 (1.1%)	94	2	4
<i>QUASI_DEBT_WARRANTS</i>	Problems associated with the recording of financing/bank/securities debt or equity section accounts.	45 (1.0%)	86.7	0	13.3
<i>Other problems with average frequency < 20 per year</i>		707 (16.0%)	96.4	0	3.6
<i>Total sample</i>		<i>4,419</i>	<i>85.7</i>	<i>2.7</i>	<i>11.6</i>

Notes: This table presents names, definitions, frequencies and remediation success for the types of material weaknesses (MW) identified in our sample companies in the *AuditAnalytics* database. Problem types are presented in order of decreasing frequency, and only those problems with a frequency greater than 20 are tabled.

Table 2. Definitions and Descriptive Statistics for Company-level Variables

<i>Variable Name</i>	<i>Definition</i>	<i>Mean (s.d.) or Percent = 1</i>	
		<i>Not fully remediated (n = 187)</i>	<i>Fully Remediated (n = 490)</i>
<i>LNASSETS</i>	Natural log of total assets [Compustat data item # 6]	6.40 (2.02)	6.68 (1.66*)
<i>FOREIGN_SUBS</i>	= 1 if the company has non-zero foreign currency translation; zero otherwise [Compustat data item #150]	44.9 %***	29.2 %
<i>MULTIPLE</i>	= 1 if the number of areas affected by the MW is greater than the sample mean	60.4 %***	28.6 %
<i>LOSS</i>	An indicator variable equal to one if the company had net loss in any of the last two years; 0 otherwise [Compustat data item #172]	56.7 %***	40.0 %
<i>LEVERAGE</i>	The ratio of total liabilities to total assets [Compustat (data item #6-data item #60)/data item #6]	0.606 (0.358)	0.578 (0.303)
<i>INSTITOWN</i>	Percentage of shares held by institutional owners [Thompson financial]	0.610 (0.273)	0.623 (0.291)
<i>REGULATED</i>	= 1 if company is in regulated industry; 0 otherwise [An indicator variable equal to one if a firm is in the financial or utility industries [SIC codes 6000 to 6999 and 4900 to 4999]]	11.2 %	24.5 %***
<i>BIG6</i>	= 1 when the auditor is one of the largest six firms; 0 otherwise [AuditAnalytics]	82.3 %	88.8 %
<i>CHANGE_SAME_TIER</i>	= 1 if the company changed its auditor within the same tier auditor; 0 otherwise [AuditAnalytics]	6.4 %	5.1 %
<i>CHANGE_DOWN</i>	= 1 if the company changed its auditor from a higher tier auditor to a lower tier auditor; 0 otherwise [AuditAnalytics]	4.8 %	6.3 %
<i>CHANGE_UP</i>	= 1 if the company changed its auditor from a lower tier auditor to a higher tier auditor; 0 otherwise [AuditAnalytics]	1.1 %	0.4 %
<i>DISMISSED</i>	= 1 if the auditor was dismissed by the company; 0 otherwise [AuditAnalytics]	6.4 %	8.2 %
<i>RESIGNED</i>	= 1 if the company's auditor resigned; 0 otherwise [AuditAnalytics]	5.9 %	3.7 %

Notes: This table describes characteristics of companies that did (did not) remediate all MW by the following year, and tests univariate differences in those characteristics between groups, using t-statistics or Chi-squared tests. The following symbols indicate significant effects, with the symbol placed by the larger of the values: * = < 0.10; ** = < 0.05; *** = < 0.01.

TABLE 3
Results of Estimating Model (1): Logistic Regression of Full MW Remediation

<i>Variable</i>	<i>Predicted Sign</i>	<i>Coefficient (Chi-squared)</i>	
		<i>(A)</i>	<i>(B)</i>
<i>LNASSETS</i>	+/-	-0.021 (0.047)	-0.029 (0.090)
<i>FOREIGN_SUBS</i>	-	-0.502 (5.843***)	-0.504 (6.033***)
<i>MULTIPLE</i>	-	-1.282 (45.219***)	-1.290 (46.122***)
<i>LOSS</i>	-	-0.331 (2.613*)	-0.300 (2.128*)
<i>LEVERAGE</i>	-	-0.400 (1.440)	-0.426 (1.665*)
<i>INSTITOWN</i>	+	0.034 (0.007)	0.061 (0.024)
<i>REGULATED</i>	+	0.924 (6.173***)	0.926 (6.059***)
<i>BIG6</i>	+	0.660 (4.613**)	0.617 (4.080**)
<i>CHANGE_SAME_TIER</i>	+/-	- 0.119 (0.083)	
<i>CHANGE_DOWN</i>	+	0.628 (2.233*)	
<i>CHANGE_UP</i>	-	-0.619 (0.160)	
<i>DISMISSED</i>	+		0.449 (0.139)
<i>RESIGNED</i>	-		- 0.157 (0.114)
<i>FY2006</i>	+/-	0.158 (0.662)	0.175 (0.815)
<i>INTERCEPT</i>		1.393 (6.931***)	1.462 (7.660***)
<i>R²</i>		0.189	0.187

Notes: This table presents results of logistic regression models estimating the likelihood of full remediation (in 2005 and 2006) of all MW reported in the prior year (2004 and 2005, respectively). The following symbols indicate significant effects: * = < 0.10; ** = < 0.05; *** = < 0.01 Variables are defined in Table 2. Industry indicators are included in the models but results are not tabled. Probability levels are expressed as one-tailed for those variables with directional expectations, two-tailed otherwise.

TABLE 4
Results of Estimating Model (2): Logistic Regression Model of MW Remediation by Type

<i>Variable</i>	<i>Predicted Sign</i>	<i>Coefficient</i>	<i>Chi-squared</i>
<i>Entity-level:</i>			
<i>DOCUMENTATION</i>		-1.479	148.373***
<i>YE_ADJUSTMENTS</i>		-0.975	34.364***
<i>TRAINING</i>		-0.867	30.324***
<i>RECONCILIATIONS</i>		-0.467	5.146**
<i>IT</i>		-1.158	25.923***
<i>SEG_DUTIES</i>		-0.600	6.330**
<i>NONROUTINE</i>		-0.558	3.419*
<i>Account-specific:</i>			
<i>TAX</i>		-1.287	43.325***
<i>REVENUE</i>		-0.942	19.902***
<i>LIAB_ACCRUAL</i>		-0.419	3.108*
<i>INVENTORY</i>		-0.582	6.435**
<i>RECEIVABLE</i>		-0.274	1.047
<i>FIXED_INTANGIBLE</i>		0.485	1.343
<i>Control variables:</i>			
<i>LNASSETS</i>	+/-	-0.080	0.835
<i>FOREIGN_SUBS</i>	-	-0.407	4.281**
<i>MULTIPLE</i>	-	-1.133	44.313***
<i>LOSS</i>	-	-0.087	0.112
<i>LEVERAGE</i>	-	-0.245	0.964
<i>INSTITOWN</i>	+	0.326	0.592
<i>REGULATED</i>	+	0.360	0.784
<i>BIG6</i>	+	0.651	4.364**
<i>CHANGE_SAME_TIER</i>	+/-	0.059	0.021
<i>CHANGE_DOWN</i>	+	0.224	0.316
<i>CHANGE_UP</i>	-	-0.589	0.407
<i>FY2006</i>	+/-	0.022	0.016
<i>INTERCEPT</i>		3.424	24.379***
<i>R²</i>		0.149	

Notes: This table presents a logistic regression model (with robust standard errors) estimating the likelihood of MW remediation by ICD type. We include indicator variables for specific problem types with an average frequency of more than 50 per year, presented in order of decreasing frequency. Industry indicators are included in the models but results are not tabled. The following symbols indicate significant effects: * = < 0.10; ** = < 0.05; *** = < 0.01 MW type variables are defined in Table 1, and control variables are defined in Table 2. Probability levels are expressed as one-tailed for those variables with directional expectations, two-tailed otherwise.

TABLE 5
Descriptive Statistics and Results of Estimating Model (3): Change in Abnormal Accruals

Panel A. Descriptive Statistics

<i>Variable Name</i>	<i>Definition</i>	<i>Mean (s.d.) or Percent = 1</i>
<i>AABSDACC</i>	The year to year change in discretionary accruals calculated from the modified Jones (1991) model augmented by ROA.	-0.009 (0.109)
<i>ALNASSETS</i>	The year to year change in the natural log of total assets [Compustat data item #6]	0.0629 (0.260)
<i>LOSS</i>	An indicator variable equal to one if the company had net loss in any of the last two years; 0 otherwise [Compustat data item #172]	0.504
<i>ALEVERAGE</i>	The year to year change in the ratio of total liabilities to total assets [Compustat (data item #6-data item #60)/data item #6]	0.002 (0.129)
<i>ACFO</i>	The year to year change in the cash flow from operations [Compustat data item #308] divided by total assets data item #6	-0.001 (0.117)
<i>AMTB</i>	The year to year change in the ratio of market to book value [share price times the number of shares outstanding [Compustat data item #25 * Compustat data item #199] divided by [Compustat data item # 60]	-0.195(3.394)
<i>EXTREME-GROWTH</i>	An indicator variable that is equal to one if year over year sales growth [data item #12] falls into the top quintile and zero otherwise	0.154
<i>BIG6</i>	An indicator variable equal to one when the auditor is one of the largest six firms; 0 otherwise [AuditAnalytics]	0.888
<i>LIT</i>	An indicator variable equal to one if company is in a litigation-prone industry; 0 otherwise [An indicator variable equal to one if a firm is in a litigious industry (SIC codes 2833 to 2836; 3570 to 3577; 3600 to 3674; 5200 to 5961; and 7370); zero otherwise]	0.284

Notes: This table describes dependent and independent variables included in Model (3), explaining change in the absolute value of abnormal accruals.

TABLE 5 (continued)
Descriptive Statistics and Results of Estimating Model (3): Change in Abnormal Accruals

Panel B. Model Results

<i>Variable</i>	<i>Predicted Sign</i>	<i>Coefficient (t-statistic)</i>	
		<i>(A)</i>	<i>(B)</i>
<i>MW-REMEDICATION</i>	-	-0.022 (-1.87**)	
<i>Entity-level:</i>			
<i>DOCUMENTATION</i>	-		-0.015 (-2.33**)
<i>YE_ADJUSTMENTS</i>	-		-0.008 (-1.01)
<i>TRAINING</i>	-		-0.006 (-0.80)
<i>RECONCILIATIONS</i>	-		-0.011 (-1.15)
<i>IT</i>	-		-0.020 (-1.82**)
<i>SEG_DUTIES</i>	-		-0.016 (-1.61*)
<i>NONROUTINE</i>	-		-0.001 (-0.90)
<i>Account-specific:</i>			
<i>TAX</i>	-		-0.019 (-1.79**)
<i>REVENUE</i>	-		-0.021 (-2.04**)
<i>LIAB_ACCRUAL</i>	-		-0.002 (-0.21)
<i>INVENTORY</i>	-		-0.018 (-2.07**)
<i>RECEIVABLE</i>	-		-0.014 (-1.40*)
<i>FIXED_INTANGIBLE</i>	-		0.005 (0.59)
<i>Control variables:</i>			
<i>ALNASSETS</i>	+	-0.019 (-0.43)	-0.009 (-0.30)
<i>LOSS</i>	+	-0.007 (-0.65)	0.006 (0.59)
<i>ΔLEVERAGE</i>	+	-0.003 (-0.08)	-0.027 (-0.068)
<i>ΔCFO</i>	+	-0.049 (-0.88)	-0.006 (-0.01)
<i>ΔMTB</i>	?	0.004 (2.58**)	0.005 (2.43**)
<i>EXTREME-GROWTH</i>	+	0.006 (0.27)	0.008 (0.34)
<i>BIG6</i>	-	0.042 (1.76*)	0.036 (1.58)
<i>LIT</i>	+	-0.14 (-0.60)	-0.014 (-0.55)
<i>FY2006</i>	?	-0.322 (-2.94***)	-0.043 (-3.77***)
<i>INTERCEPT</i>	?	-0.100 (-3.94)	-0.088 (-3.75)
<i>R²</i>		0.162	0.191

Notes: This table presents results of regression models (with robust standard errors) of the change in abnormal accruals with remediation of specific types of MW and control variables. We include indicator variables for specific problem types with an average frequency of more than 50 per year, presented in order of decreasing frequency. Industry indicators are included in the models but results are not tabled. The following symbols indicate significant effects: * = < 0.10; ** = < 0.05; *** = < 0.01 Variables are defined in Table 1. Probability levels are expressed as one-tailed for those variables with directional expectations, two-tailed otherwise.

TABLE 6
Summary of Results on Specific MW Problem Types

	A. <i>Relative Frequency</i>	B. <i>Lower Remediation Likelihood</i>	C. <i>Remediation Associated with Improved Earnings Quality</i>
Entity-Level			
<i>DOCUMENTATION</i>	1	***	**
<i>YE_ADJUSTMENTS</i>	2	***	
<i>TRAINING</i>	3	***	
<i>RECONCILIATIONS</i>	4	**	
<i>IT</i>	5	***	**
<i>SEG_DUTIES</i>	6	**	*
<i>NONROUTINE</i>	7	*	
Account-Specific			
<i>TAX</i>	1	***	**
<i>REVENUE</i>	2	***	**
<i>LIAB_ACCRUAL</i>	3	*	
<i>INVENTORY</i>	4	**	**
<i>RECEIVABLE</i>	5		*
<i>FIXED_INTANGIBLE</i>	6		

Notes: This table summarizes results presented in Tables 1, 4 and 5. Column A shows frequency order within entity-level and account-specific groups, with 1 = most frequent. Columns B and C indicate by asterisks the types found to be significant in the remediation likelihood and accruals models, respectively. The following symbols indicate significant effects: * = < 0.10; ** = < 0.05; *** = < 0.01