

**Internal Governance, External Governance, and
Internal Control Material Weakness Remediation**

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Current Draft: December 10, 2007

We thank Bill Baber, Mike Ettredge, Elizabeth Almer, John Bizjak, Darrell Brown, and participants of research workshops at the University of Kansas and Portland State University for their comments.

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ABSTRACT: In light of the recently enacted laws to protect shareholder interests via disclosing material weaknesses in internal controls, we examine changes in corporate governance characteristics that are associated with the remediation of SOX Section 404 internal control material weakness disclosures. We investigate the roles of both external governance characteristics (e.g., nature of audit firm, analyst following, and blockholder shareholdings) and internal governance characteristics (e.g., board of director, audit committee, and management) in accomplishing remediation, finding that remediation is associated with improvements in internal governance, but not external governance. Undertaking these analyses is important because determining the types of corporate governance improvements that are associated with remediation informs regulators and market participants about fruitful avenues to pursue in assuring high quality internal controls and financial reporting.

Keywords: SOX 404, internal control material weakness remediation, corporate governance.

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

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I. INTRODUCTION

To improve the financial reporting process and restore investors' confidence in the financial market following recent corporate reporting scandals, Congress passed the Sarbanes-Oxley Act of 2002 (SOX). One of the significant provisions of SOX is Section 404, which requires publicly registered companies and their external auditors to report on the effectiveness of companies' internal controls over financial reporting, or to reveal the presence of internal control material weaknesses (ICMWs). SOX, and related listing requirements of the NYSE and NASDAQ, also contains regulations intended to improve the conduct of audit committees and principal company officers and to encourage more effective internal (e.g., board and management) and external (e.g., auditors and analysts) corporate governance from registrants. The purpose of this study is to investigate the respective roles of internal and external governance in remediating ICMWs revealed via the new requirements in SOX.

Prior research on internal control reporting in this contemporary environment finds that ICMWs impose costs on companies, such as decreased stock price (Gupta and Nayar 2006; Hammersley et al. 2008), increased cost of equity (Ashbaugh-Skaife et al. 2007a), higher audit fees (Raghunandan and Rama 2006), and shareholder dissatisfaction (Ye and Krishnan 2007). Empirical studies also provide evidence that remediation of previously reported ICMWs is associated with decreases in the cost of equity (Ashbaugh-Skaife et al. 2007a) and improvements in shareholder satisfaction (Ye and Krishnan 2007). Since the responsibility of the board of directors is to assure that overall internal controls and financial reporting processes are effective, and the responsibility of the audit committee

is to oversee internal controls and to communicate with management and external auditors (SEC 34-48745 2003), it is important to examine the relation between changes in internal governance, external governance, or both, in conjunction with internal control remediation to determine what types of improvements in corporate governance can help companies restore investor confidence through improved internal controls.

Prior research shows that weak corporate governance levels are associated with poor corporate performance, earnings management, and financial restatements (Core et al. 1999; Klein 2002; Baber et al. 2006; Srinivasan 2005; Agrawal and Chadha 2003), and that internal control quality is associated with corporate size, growth, complexity, and financial health (Doyle et al. 2006; Ashbaugh-Skaife et al. 2006a). However, there are only a few papers that specifically examine the association between corporate governance characteristics and internal control quality, and these papers focus on characteristics of the audit committee (Krishnan 2005; Zhang et al. 2006; Bedard et al. 2007). There is only one paper, to our knowledge, that examines changes in corporate governance factors that assist companies in remediating ICMWs. Li et al. (2007) find that companies with ICMWs are more likely to experience CFO turnover, and that the quality of the new CFO is positively associated with remediation.

Using a sample of companies receiving adverse SOX 404 opinions in 2004 (the first year of SOX 404 reporting), we examine changes in corporate governance for companies that remediated ICMWs in 2005 (i.e., companies with material weaknesses in the first year, but effective internal controls in the second year) compared to companies having no remediation in 2005 (i.e., companies having material weaknesses in both years). We also examine the comparative roles of changes in external governance characteristics, internal

governance characteristics, and company business characteristics in explaining the remediation of ICMWs. We obtain internal control information from auditors' SOX 404 reports and corporate governance information from corporate proxy statements.

Turning to results, we find that after controlling for the severity and pervasiveness of the initial internal control weaknesses, remediation occurs in conjunction with internal corporate governance changes. Companies accomplishing ICMW remediation exhibit changes toward more effective boards of directors (increases in independent directors, number of independent directors serving on other boards, independent board member tenure, and shareholdings of independent directors), changes toward more effective audit committees (increases in audit committee members that chair the board, audit committee financial experts, and shareholdings of audit committee members), and changes toward more effective top management (increases in CFOs with accounting experience, CFO tenure, and the number of CEOs serving on other boards of directors).

We also explore differences in the remediation of "general" ICMWs (e.g., if the weakness has a pervasive effect at the company-level) versus "specific" ICMWs (e.g., if the weakness is at the account or transaction-level), and we continue to find changes in internal governance characteristics related to the board, audit committee, and management are associated with the remediation of general material weaknesses. Additionally, we explore what types of ICMWs are most difficult to remediate. We find that material weaknesses in personnel, control design or process in procedures, and control environment areas are less likely to be remediated. Finally, we do not find that external governance changes related to external auditors, blockholders, and analysts are important factors in explaining remediation. However, when we restrict our sample to

only general ICMWs (i.e., excluding “specific” ICMWs), we find that that increased analyst following is positively associated with remediation.

This paper contributes to the corporate governance and internal control literature in two ways. First, our results reveal how changes in internal governance are associated with ICMW remediation. Only one prior paper of which we are aware examines remediation associated with changes (rather than levels) in corporate governance. Li et al. (2007) demonstrate the importance of CFO competence in improving internal control. We extend this line of research by investigating the broader association of changes in other management characteristics, boards, and audit committees with remediation. As such, we are able to comment on a broader array of potential avenues for companies to consider as they work to achieve higher quality internal controls.

Second, we examine the incremental explanatory effects of changes in external versus internal governance on ICMW remediation. From a public policy standpoint, it is important to know which types of governance mechanisms drive improvements in internal control quality, and ultimately financial reporting quality. Baber et al. (2006) show that strong external governance (fewer restrictions on shareholder rights) plays a dominant role over internal governance (board and audit committee characteristics) in explaining the probability of financial restatements. Further, Ashbaugh-Skaife et al. (2007b) find that companies remediating ICMWs exhibit increases in accrual quality. These results suggest that improvements in external governance factors may be associated with remediation since both restatements and accrual quality are proxies for overall financial reporting quality. However, our results suggest that internal, rather than external, governance factors drive internal control remediation. Therefore, while external

governance is important in mitigating some financial reporting problems, internal governance appears to be most important in the specific context of ICMW remediation.

The remainder of the paper is organized as follows. Section 2 discusses background, prior research, and develops the hypotheses. Section 3 discusses methods. Section 4 includes descriptive statistics, hypothesis-testing results, and exploratory analyses. The final section describes limitations and conclusions.

II. BACKGROUND, PRIOR RESEARCH, AND HYPOTHESES

Internal Control and Relevant Regulations

The Committee of Sponsoring Organizations (COSO) of the Treadway Commission defines internal control as “a process, effected by an entity’s board of directors, management, and other personnel, designed to provide reasonable assurance regarding the achievement of objectives.” The SEC adopted the final rules for SOX Section 404, “Management Assessment of Internal Controls” on June 5, 2003. SOX Section 404, effective for publicly traded companies with fiscal year-ends subsequent to November 15, 2004,¹ requires an annual management report on internal controls over financial reporting (ICOFR) to be filed with the SEC Form 10-K annual report. The management report must be accompanied by an auditor attestation report by the registered public accounting firm that audited the company’s financial statements. The auditor attestation report includes both the auditor’s opinion on management’s assessment of internal controls and the auditor’s opinion on the effectiveness of the company’s ICOFR (SOX 2002).

Internal control deficiencies are classified into three categories in increasing order of severity: control deficiencies, significant deficiencies, and material weaknesses. Prior to

¹ Effective date for non-accelerated filers under Rule 12b-2 of the Exchange Act is for fiscal years ending on or after July 15, 2007.

the passage of SOX, the only required public disclosures of internal control deficiencies were material weaknesses in SEC Form 8-K “change of auditor” disclosures. Subsequent to SOX, registrants are required, under SEC Regulation S-K Item 307, to disclose conclusions regarding the effectiveness of the firm’s ICOFR in the annual reports. The reports must include the disclosure of any material weakness in the registrant’s ICOFR, and procedures and corrective actions taken regarding the material weakness. When one or more material weaknesses exist in a firm’s ICOFR, the auditor is required to issue an adverse 404 opinion.

Corporate Governance Framework

In accordance with agency theory, when there is a separation between ownership and management of a company, management may have incentives to maximize their own utility, and therefore might not act in the best interest of the company (Jensen and Meckling 1976). Corporate governance mechanisms can help mitigate the potential problems associated with the separation of management and ownership.

Corporate governance can take the form of mechanisms both internal and external to the company (Gillan 2006). Management and its board of directors are internal corporate governance instruments. Management acts as an agent for shareholders by investing the firm’s resources and by deciding how to finance additional investments. Boards of directors, in turn, are elected by shareholders to hire, monitor, and advise management in the interests of shareholders. Blockholders, analysts, and independent auditors are external corporate governance instruments. Blockholders, with their voting power, can ratify the election of board of director members; analysts can influence firm managers to

act in the best interests of shareholders; and independent auditors help monitor corporate financial reporting and internal control processes.

Prior Research and Hypotheses Development

Prior research on corporate governance examines the association between corporate governance characteristics and corporate performance and financial reporting quality, including investors' confidence in reported earnings numbers (Dey 2004), earnings management (Klein 2002), earnings quality (Vafeas 2005), SEC enforcement actions (Beasley 1996; Dechow et al. 1996), quality of the financial reporting systems (La Porta et al. 1998; Bushman et al. 2000), restatements (Baber et al. 2006; Srinivasan 2005; Agrawal and Chadha 2003), and audit quality (Becker et al. 1998; Francis et al. 1999). These studies generally find that companies with more effective corporate governance have superior financial performance and financial reporting quality.

Recent research examining internal control quality and its association with company characteristics generally reports that companies disclosing ICMWs tend to be smaller, younger, financially weaker, more complex, growing rapidly, undergoing restructuring, under more accounting risk exposure, and have fewer resources to invest in internal control systems (Doyle et al. 2007; Ashbaugh-Skaife et al. 2007a). Other research on internal control quality finds ICMWs impose costs on companies. For example, disclosures of ICMWs generate negative market reactions (De Franco et al. 2005; Gupta and Nayar 2006; Hammersley et al. 2008), increase companies' cost of equity capital (Ashbaugh-Skaife et al. 2007a), are positively associated with dissatisfied shareholders (Ye and Krishnan 2007), and are associated with subsequent auditor resignations (Ettredge et al. 2007).

Other recent research investigates the association between levels of internal and external corporate governance characteristics and internal control quality. Krishnan (2005) and Bedard et al. (2007) report a positive association between levels of high quality internal corporate governance (audit committee expertise and independence) and internal control quality. Zhang et al. (2006) find that both levels of internal governance (audit committee financial expertise) *and* external governance (external auditor independence and changes in external auditor) are both positively associated with internal control quality. In contrast, Jensen and Payne (2003) find that levels of internal governance (existence of internal audit function and accounting staff expertise) and external governance (external auditor industry experience) are *substitutes* for one another in the monitoring of internal control systems. Jensen and Payne (2003) examine a sample of municipalities and find that those who hire accounting and finance personnel with low levels of experience, and who do not hire internal auditors, tend to hire external auditors with higher levels of expertise.

We extend this prior literature by examining the relative importance of changes in both internal and external corporate governance characteristics associated with ICMW remediation. Companies focus remediation efforts in several areas, including improving policies and procedures, personnel, training, international operations, and board of director membership and procedures (Fargher and Gramling 2005).² While prior research focuses primarily on how variation in levels of internal and external corporate

² Policy and procedure remediation includes actions such as improving documentation and segregation of duties. Personnel remediation includes appointing new accounting staff, a new CFO, or a new Controller. International operation remediation includes actions such as increased review of overseas financial reporting operations or centralizing accounting functions. Board remediation includes actions such as adding board members with financial expertise or changing procedures for reporting to the board or audit committee.

governance characteristics is associated with the relative quality of internal controls, our focus is on understanding how companies make positive changes in their internal controls when one or more material weakness has been uncovered. We also consider the nature and extent of ICMWs and the role of company business characteristics in explaining remediation. Our conceptual model describing this change process is:

$$\text{Remediation} = f [\text{changes in external governance} + \text{changes in internal governance} + \text{nature and extent of ICMWs} + \text{changes in company business characteristics}]$$

External Governance

External governance players include auditors, blockholders, and analysts who can help motivate companies to act in shareholders' best interests (Francis and Wilson 1988; Bethel et al. 1998; Yu 2007). Prior research examining the relation between external governance and internal control weaknesses finds that companies are more likely to report ICMWs if the company's external auditors are more independent, measured as the percent of audit fees to total fees paid to the auditor, and if the company had a recent change in external auditors (Zhang et al. 2006). Hartzell and Starks (2003) suggest that large institutional blockholders moderate executive compensation, and Bethel et al. (1998) provide evidence that active blockholders increase shareholder value. Yu (2007) finds that companies with greater analyst following are less likely to manage earnings and thus are more likely to act in the best interest of shareholders. Baber et al. (2006) find that companies with strong external governance (fewer restrictions on shareholder rights) are less likely to experience financial restatements. Because prior research has found an association between levels of external governance and both financial reporting quality

and internal control quality, it is likely that changes in external governance are associated with ICMW remediation. Therefore, our first hypothesis is:

H1: Remediation is positively associated with shifts toward stronger external corporate governance.

Internal Governance

Board of Directors

The board of director's ability to monitor and advise a firm is affected by its influence, competence, incentives, and involvement. Prior research finds that stronger boards are associated with less earnings management, restatements, and fraud (Beasley et al. 2000; Klein 2002; Bedard et al. 2004). Bedard et al. (2007) find that overall board quality (a score based on board size, board independence, and board tenure) is associated with higher levels of internal control quality. As such, we anticipate that remediation of ICMWs will be positively associated with shifts toward stronger monitoring by boards of directors.

Audit Committees

Audit committees with greater influence, competence, incentives, and involvement should more effectively monitor and advise companies. Krishnan (2005) examines the association between audit committee quality and internal control quality using SEC Form 8-K disclosures of changes in auditors to identify companies with internal control deficiencies. She compares these companies to a matched sample that also report a change in auditors on Form 8-K, but that do not possess internal control deficiencies. The results reveal that independent audit committees and audit committees with financial expertise are significantly less likely to be associated with both material weakness and reportable condition internal control disclosures, and that auditor resignations are

positively associated with internal control deficiencies. In a similar study, Zhang et al. (2006) examine the relation between audit committee characteristics and ICMWs, showing that companies are more likely to have ICMWs if the audit committee has less financial expertise. Bedard et al. (2007) also examine the association between audit committee financial experts and ICMWs. They find that ICMWs are less likely for companies with audit committee members having superior accounting and supervisory financial qualifications. As such, we anticipate that remediation of ICMWs will be positively associated with shifts toward stronger monitoring by audit committees.

Management

Finally, management with superior competence and appropriate incentives should more effectively monitor and advise companies. Li et al. (2007) examine whether changes in CFOs affect the remediation of ICMWs and find that hiring a more capable CFO (a CFO with more accounting knowledge and work experience), or hiring a CFO from outside the company, significantly increases the likelihood of remediating ICMWs. Therefore, we expect that remediation of ICMWs will be positively associated with shifts toward stronger management teams. Taken together, these expectations regarding the relation between ICMW remediation and boards of directors, audit committees, and management suggest the following hypothesis:

H2: Remediation is positively associated with shifts toward stronger internal corporate governance.

Nature and Extent of ICMW

There are two categories of material weaknesses in internal controls: general and specific. General material weaknesses refer to control weaknesses at the company-level that “might have a pervasive effect on the achievement of many overall objectives of the

control criteria” (PCAOB 2004, para. 50). Examples of general material weaknesses include an ineffective control environment, ineffective IT systems, and an inadequate internal audit or risk assessment function. Specific material weaknesses refer to control weaknesses embedded within specific controls that are “designed to achieve specific objectives of the control criteria” (PCAOB 2004, para. 50). These relate to internal control deficiencies over transaction-level processes or specific account balances, such as inventory, accounts receivable, and legal proceedings (Doss 2004).

Prior research (Ge and McVay 2005; Ettredge et al. 2006) also categorizes material weakness based upon the Committee of Sponsoring Organization’s (COSO) framework, which highlights specific components/elements of an internal control system. Material weakness categories in the COSO framework include personnel issues, lack of segregation of duties, documentation issues, information technology issues, deficiencies in control design or process and procedures, deficiencies with the closing process, and deficiencies in the control environment. Within these categories, one might imagine general versus specific problems. For example, if a company reports a lack of financial expertise in the tax area, this is a *specific* personnel-related deficiency. In contrast, if a company reports a lack of financial expertise in the financial reporting system, this is a *general* personnel-related deficiency.

Prior research suggests that, compared to specific internal control weaknesses, general internal control weaknesses have more pervasive effects upon various aspects of financial reporting and auditing (Doyle et al. 2007; Ettredge et al. 2006; Ettredge et al. 2007). Because of the pervasiveness of general material weaknesses, we expect them to be more difficult to remediate. In addition, we anticipate that the extent of ICMWs is

likely to have an effect on remediation. A larger number of problems likely indicates that ICMW weaknesses are more pervasive, suggesting that those problems will be more difficult to remediate. This discussion suggests the following hypotheses:

H3a: Remediation is negatively associated with general ICMWs.

H3b: Remediation is negatively associated with the number of ICMWs.

III. METHODS

Sample

We obtain our data primarily from the Audit Analytics database. Accelerated filers with fiscal year-ends on or after November 15, 2004 are required to file SOX 404 internal control reports. Our sample consists of companies with December fiscal year-ends that reported ICMWs in the 2004 SOX 404 reports, and that filed their 2005 SOX 404 reports before May, 31, 2006. The initial sample consists of 406 companies. We then require the necessary governance information from proxy statements and financial information from Compustat. These sample selection procedures yield our final sample of 355 companies. Of these, 264 report ICMWs in 2004 and reveal remediation of those weaknesses in 2005, while 91 companies report ICMWs in both 2004 and 2005 (i.e., no remediation). All variables are measured as the change between 2004 and 2005, unless otherwise indicated. Table 1 Panels A and B detail the sample collection process, while Panels C, D, and E provide information on sample composition by exchange, auditor, and industry.

-----Insert Table 1 Here-----

Variables

Dependent Variable

For our primary hypotheses tests, we use the dependent variable, ICIMPROVE, which equals one for companies reporting remediation in 2005, and zero for companies continuing to report ICMWs in 2005.

Independent Variables

External Governance Variables

Auditors with more expertise and resources should provide better monitoring of companies' internal control processes and financial reporting. Consistent with prior research (e.g. Toeh and Wong 1993; Lee et al. 2004), we proxy for auditor quality based on auditor size. We measure changes in auditor quality using ΔBIG4 , which equals one (negative one) if the company changed to a Big 4 (non-Big 4) auditor from a non-Big 4 (Big 4) auditor, and equals zero otherwise. We predict that ΔBIG4 will be positively associated with remediation because a shift to a higher quality auditor signals a desire on the part of the company to improve corporate governance in general and to improve internal controls in particular.

By acting as activists for shareholders, blockholders can influence companies to act in shareholders' best interests (Gillan and Starks 2003; Bethel and Gillan 2002). We measure this type of influence using ΔBLOCK , which equals the change in the proportion of blockholdings of common stock. We expect this variable to be positively associated with remediation. Similar to blockholders, analysts can also influence companies to act in the best interest of shareholders. For example, Yu (2007) finds that companies with greater analyst following are less likely to manage earnings. We measure

this type of influence using Δ ANALYST, which equals the change in the average number of analysts following the company. We expect this variable to be positively associated with remediation.³

Internal Governance Variables

Board of Directors. Board members' influence, competence, and incentives each affect how well boards can monitor and advise companies. We proxy for board influence using the variable Δ INDEPDIR, which equals the change in the proportion of independent directors on the board. In addition, we measure Δ IDIRCHAIR, which equals one (negative one) if the chair of the board changed from a non-independent (independent) director to an independent (non-independent) director, and equals zero otherwise. We measure board competence using Δ IDIRTENURE, which equals the change in the natural log of the average independent director tenure,⁴ and Δ IDIRBOD, which equals the change in the percentage of independent directors who serve on other corporate boards. Regarding board incentives, we measure the change in shares held by directors, Δ IDIRSHR, which equals the change in the percentage of total shareholdings of independent directors. We predict that each of the variables will be positively associated with remediation.

Audit Committees. Like the overall board of directors, the effectiveness of audit committee monitoring is affected by its members' influence, competence, and incentives. We proxy for audit committee influence using the measure Δ ACCHAIR, which equals

³ Baber et al. (2007) proxy for external governance using the g-index. Because we examine the changes in external governance between 2004 and 2005 and g-index data is available for 2004 and 2006, but not for 2005, we do not use the g-index in our analyses. In a sensitivity test, we include in our hypothesis-testing models the 2004 levels of the g-index and find that the g-index level variable is not significant.

⁴ We use the change in the natural log of the average independent director tenure here to allow the variations of the change variable. If a firm changes the director, this variable should be negative, and it captures the difference between the tenure of the new director (1 year) and the tenure of the old director. An indicator variable cannot capture this information.

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one (negative one) if the chair of the board changes from a non-audit (audit) committee member to an audit (non-audit) committee member, and equals zero otherwise. We measure audit committee competence using ΔACEXP , which equals the change in the number of audit committee members who possess financial expertise.⁵ We measure audit committee incentives using ΔACSHR , which equals the change in the percentage of shareholdings of audit committee members. We predict that each of these variables will be positively associated with remediation.

Management. Following Li et al. (2007), we proxy for changes in CFO experience using $\Delta\text{CFOACCTEXP}$, which equals one (negative one) if the prior experience of the CFO changed from not having (having) experience as a CPA or as a public accounting firm accountant to having (not having) experience as a CPA or public accounting firm accountant, and equal to zero otherwise. We also measure $\Delta\text{CFOTENURE}$, which equals the change in the natural log of the number of years the CFO has been employed as CFO. We measure shifts in CEO reputation using ΔCEOBOD , which equals the change in the total number of boards on which the CEO serves. We predict that each of these variables will be positively associated with remediation.

Nature and Extent of ICMWs

Prior research suggests that, compared to specific internal control weaknesses, general internal control weaknesses have more pervasive effects upon various aspects of

⁵ We define financial expertise as accounting expertise (e.g., audit committee members who have experience as a CFO, CPA, controller, and those with public accounting firm experience) and finance expertise (e.g., audit committee members who have experience as an investment banker or venture capitalist). When we use accounting expertise only, our results remain the same.

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financial reporting and auditing (Li et al. 2006; Ettredge et al. 2006; Ettredge et al. 2007). Consistent with these studies, we proxy for general material weaknesses, GENERAL, as equal to one if the ICMW has a pervasive effect at the company-level, and equal to zero if the ICMW is related to a specific non-pervasive control. Additionally, we proxy for the pervasiveness of control problems using the number of ICMWs reported in 2004 (NUMBER). Consistent with H3a and H3b, we expect both GENERAL and NUMBER to be negatively associated with remediation.

Business Characteristic Variables

High growth companies may not have the funds or management resources to invest in optimal internal control mechanisms. We proxy for company growth using the measure Δ GROWTH, which equals sales growth from 2004 to 2005. Given competing resource demands between growing the business and improving internal controls, we predict Δ GROWTH will be negatively associated with remediation. Similarly, a company under financial distress may not have sufficient resources to allocate to maintaining adequate internal controls. We proxy for changes in financial distress using (1) Δ LEVERAGE, which equals the change in leverage (total debt divided by total assets) from 2004 to 2005, and (2) Δ ROA, which equals the change in ROA (net income divided by total assets) from 2004 to 2005. We predict that Δ LEVERAGE will be negatively associated with remediation, while Δ ROA will be positively associated with remediation.

We proxy for changes in business complexity using measures representing the number of business segments and the existence of restructuring activities. Δ SEGMENT is equal to the change in the natural log of the number of business segments. Δ RESTRUCT is equal to one (negative one) if a company changes from not engaging (engaging) in

restructuring to engaging (not engaging) in restructuring, and zero otherwise.⁶ We expect a negative association between the Δ SEGMENT and Δ RESTRUCT variables and remediation Table 2 summarizes the variable definitions and their expected signs.

-----Insert Table 2 Here-----

In summary, we use a logistic regression model to examine the association of changes in external corporate governance (H1), changes in internal corporate governance (H2), the nature and extent of ICMWs (H3), and changes in company business characteristics with ICMW remediation, employing the following model:

$$\begin{aligned} \text{ICIMPROVE} = & a + b_1\Delta\text{BIG4} + b_2\Delta\text{BLOCK} + b_3\Delta\text{ANALYST} + b_4\Delta\text{INDEPDIR} + \\ & b_5\Delta\text{IDIRCHAIR} + b_6\Delta\text{IDIRTENURE} + b_7\Delta\text{IDIRBOD} + b_8\Delta\text{IDIRSHR} + \\ & b_9\Delta\text{ACCHAIR} + b_{10}\Delta\text{ACEXPERT} + b_{11}\Delta\text{ACSHR} + b_{12}\Delta\text{CFOACCTEXP} + \\ & b_{13}\Delta\text{CFOTENURE} + b_{14}\Delta\text{CEOBOD} + b_{15}\text{GENERAL} + b_{16}\text{NUMBER} + \\ & b_{17}\Delta\text{GROWTH} + b_{18}\Delta\text{LEVERAGE} + b_{19}\Delta\text{ROA} + b_{20}\Delta\text{SEGMENT} + \\ & b_{21}\Delta\text{RESTRUCT} + \text{One-digit SIC Industry Indicators} + e \end{aligned} \quad (1)$$

In addition to the logistic regression analysis, we also use a change in Pseudo R² test to examine the incremental explanatory power of changes in external governance, changes in internal governance, characteristics of ICMWs, and changes in company business characteristics in explaining remediation.

V. RESULTS

Descriptive Statistics

Table 3 presents descriptive statistics, comparing companies that did versus did not remediate ICMWs. In 2004, there are relatively few differences between the two samples.

⁶ This variable is coded one if at least one of the following *Compustat* annual data items is not equal to zero for year 2005: 376, 377, 378, or 379.

Companies that subsequently remediated ICMWs had marginally fewer blockholders ($t = -1.775$, $p = 0.077$), marginally more independent directors ($t = 1.912$, $p = 0.057$), significantly fewer number of ICMWs ($t = -6.754$, $p = 0.000$), and had fewer general ICMWs as opposed to specific ICMWs ($t = -3.567$, $p = 0.000$).

-----Insert Table 3 Here-----

In 2005, the differences between the remediation and no remediation samples are more striking. Companies remediating ICMWs had a significantly greater proportion of independent directors ($t = 3.191$, $p = 0.002$), longer director tenure ($t = 2.078$, $p = 0.038$), more board members serving on other boards ($t = 6.163$, $p = 0.000$), and a greater percentage of company shareholdings by independent directors ($t = 2.390$, $p = 0.017$). Companies remediating ICMWs also had greater financial expertise on the audit committee ($t = 2.511$, $p = 0.012$) and a marginally greater percentage of company shareholdings by audit committee members ($t = 1.705$, $p = 0.089$). Remediation companies also had better qualified management, in terms of the CFO having more accounting expertise ($t = 2.344$, $p = 0.020$), longer CFO tenure ($t = 3.416$, $p = 0.001$), and a greater number of external boards on which the CEO serves ($t = 3.242$, $p = 0.001$). Finally, remediation companies have higher growth ($t = 2.217$, $p = 0.027$), and higher ROA ($t = 2.497$, $p = 0.013$).

The last column in Table 3 represents the significance level for the difference in changes from 2004 to 2005 between the remediation and non-remediation companies. There are no differences in changes between the two groups in terms of outside governance, i.e., external auditor, blockholdings, and analyst following. However, in terms of internal governance associated with board characteristics, we find that

companies remediating ICMWs had an increase in the proportion of independent directors, whereas non-remediation companies had a decrease in the proportion of independent directors ($t = 1.998$, $p = 0.046$), and there was a similar pattern in terms of the percentage of independent directors who also serve on other companies' boards ($t = 7.878$, $p = 0.000$). Contrary to predictions, companies remediating ICMWs show a decrease in the percentage of shareholdings of independent directors, but non-remediation companies show a significantly larger decrease ($t = 2.670$, $p = 0.008$).

Audit committee characteristics also differ between the remediation and non-remediation samples. The percentage of audit committee members serving as Chair of the Board increased for remediation companies, but decreased for non-remediation companies ($t = 2.456$, $p = 0.015$). Audit committee expertise increased for remediation companies, but decreased for non-remediation companies ($t = 6.280$, $p = 0.000$). Contrary to predictions, companies remediating ICMWs show a decrease in the percentage of shareholdings of audit committee members, but non-remediation companies show a significantly larger decrease ($t = 2.087$, $p = 0.038$).

Changes in top management are also evident between the remediation and non-remediation samples. There was an increase in CFO accounting expertise for remediation companies, but a decrease for non-remediation companies ($t = 2.904$, $p = 0.004$). There was also an increase in CFO working experience for remediation companies, but a smaller increase for non-remediation companies ($t = 2.637$, $p = 0.009$). These results indicate remediation groups tend to hire more capable CFOs (measured as both accounting knowledge and working experience). Finally, CEOs of remediation

companies show an increase in the number of external boards on which they serve, whereas CEOs of non-remediation companies show a decrease ($t = 4.527, p = 0.000$).

Finally, leverage showed a marginally more significant decline for remediation companies compared to non-remediation companies ($t = -1.815, p = 0.070$), and ROA improved for remediation companies, but became weaker for non-remediation companies ($t = 2.443, p = 0.015$).

Table 4 reports the correlations between the change of internal control, corporate governance, and business characteristic variables. The correlations among the independent variables are relatively low, with the highest correlation occurring between GENERAL and NUMBER ($r = 0.396, p = 0.000$). Using a linear regression to test the variance inflation factor indicates the highest is only 1.794, which is well below the suggested threshold of ten, indicating multicollinearity is unlikely to be problematic (Marquardt 1980; Gujarati 1995).

-----Insert Table 4 Here-----

Regression Results

Table 5 reports the results of the logistic regression for Model 1. There are six versions of Model 1. The first model, Model 1a, includes characteristics of external corporate governance. The subsequent models successively include variables for internal corporate governance as it relates to board of directors (Model 1b), audit committees (Model 1c), top management (Model 1d), ICMW characteristics (Model 1e), and business characteristics (Model 1f). The last column (Model 1f) is the full model and is highly significant ($p=0.000$) with a pseudo R^2 of 0.608.

-----Insert Table 5 Here-----

The results of Model 1f reveal no association between changes in external governance characteristics and ICMW remediation. As such, H1 is not supported.

In contrast, improvements in internal governance characteristics are strongly associated with remediation. Regarding board characteristics, an increase in the proportion of independent directors on the board ($X^2 = 3.978$, $p = 0.023$), an increase in independent director tenure ($X^2 = 3.403$, $p = 0.033$), an increase in the percentage of independent directors who also serve on other companies' boards ($X^2 = 30.791$, $p = 0.000$), and an increase in the percentage of the total shareholdings of independent directors ($X^2 = 1.676$, $p = 0.098$) are each positively associated with remediation. Regarding audit committee characteristics, shifts toward having an audit committee member chairing the board ($X^2 = 4.943$, $p = 0.013$), more audit committee financial expertise ($X^2 = 22.038$, $p = 0.000$), and an increase in the percentage of shareholdings of audit committee members ($X^2 = 3.124$, $p = 0.039$) are each positively associated with remediation. Regarding governance involving top management, the results reveal that a shift toward a CFO with financial accounting expertise ($X^2 = 3.712$, $p = 0.027$), longer CFO tenure ($X^2 = 5.132$, $p = 0.012$), and a larger number of boards on which the CEO serves ($X^2 = 10.283$, $p = 0.001$) are also positively associated with remediation. Thus, the results provide strong support for H2.⁷

In terms of characteristics of ICMWs, the results show that general (as opposed to specific) ICMWs are more difficult to remediate ($X^2 = 3.761$, $p = 0.026$), and that larger

⁷ As sensitivity tests, we also include the change of directors serving on more than three boards (busy directors), the change of board meetings, the change of audit committee meetings, and the change of CEO. None of those variables are significant and our results remain unchanged.

numbers of ICMWs are also negatively correlated with remediation ($X^2 = 8.411$, $p = 0.002$). These results support H3a and H3b.

We also perform tests of changes in pseudo R^2 to examine the incremental explanatory power of adding internal corporate governance factors, internal control weakness characteristics, and company business characteristics to the model. The p-values of the changes in pseudo R^2 in Table 5 suggest that the changes in internal corporate governance factors (monitoring from board of directors, audit committee, and top management) each significantly increase the model's explanatory power ($p = 0.000$ for Models 1b, 1c, and 1d). These results provide further evidence that internal corporate governance is the most important factor associated with remediation of ICMWs.

Additional Analysis

Types of Material Weakness Reported

Following prior research (Ge and McVay 2005; Ettredge et al. 2006), we also categorize types of material weaknesses based on the specific elements of internal control systems defined by the COSO framework, and explore which types of ICMWs are more likely to be remediated. We identify seven types of control problems: personnel issues (PERSONNEL), lack of segregation of duties (SEGDUTY), documentation issues (DOCUMENT), information technology issues (IT), deficiencies in control design or process and procedures (DESIGN/PROCESS), deficiencies with the closing process (CLOSING), and deficiencies in the control environment (ENVIRONMENT). To conduct our analysis, we include these variables in our original hypothesis-testing model in place of the ICMW characteristics variables, GENERAL and NUMBER.

Table 6 includes a description of the frequency counts of the various COSO framework material weakness types for the Remediation and No Remediation samples. Fifty-five (30) percent of No Remediation (remediation) companies report personnel problems; 35 (19) percent report segregation of duties issues; 25 (14) percent report documentation issues; 21 (7) percent report IT issues; 82 (73) percent report design/process issues; 44 (22) percent report closing issues; and lastly, 20 (5) percent report environment issues, respectively. Differences between the Remediation and No Remediations samples are significant at the 1% level or 5% for all material weakness issues other than control design/process issues, which is not significant.

-----Insert Table 6 and 7 Here-----

Results in Table 7 (model 2) reveal that weaknesses associated with personnel ($X^2 = 3.860$, $p = 0.049$), the closing process ($X^2 = 3.905$, $p = 0.048$), and the control environment ($X^2 = 6.755$, $p = 0.009$) are the most difficult to remediate.

Analysis of General Material Weakness

As revealed via the results in Table 5, general material weaknesses are negatively associated with remediation. Because general material weaknesses are more pervasive and have a more severe impact than specific material weaknesses (Doyle et al. 2007; Ettredge et al. 2006; Ettredge et al. 2007), we conduct a supplemental analysis in which we restrict the sample to companies reporting general ICMWs in 2004 (i.e., eliminating companies reporting specific ICMWs) in order to consider factors associated with these more difficult to remediate ICMWs (Table 7, model 3). For that analysis, we use the dependent variable, GENERAL IMPROVE, which equals one for companies reporting

general ICMWs in 2004 and reporting remediation in 2005, and equals zero for companies reporting general ICMWs in 2004 but not reporting remediation in 2005.

Results indicate that, consistent with previous results, internal governance characteristics as related to the board, audit committee, and management each contribute to the remediation of general material weaknesses. Regarding board characteristics, companies with an increased number of independent directors ($X^2 = 1.695$, $p = 0.097$) and an increased number of independent directors that serve on other companies' boards ($X^2 = 2.546$, $p = 0.056$) are more likely to remediate general material weaknesses. Considering audit committee characteristics, an increase in shareholdings of audit committee members is positively associated with remediation of general material weaknesses ($X^2 = 2.024$, $p = 0.078$). Considering characteristics of top management, companies with increased CFO tenure are more likely to remediate general material weaknesses ($X^2 = 1.896$, $p = 0.085$). In contrast to the results in Table 5, these results also indicate that increases in analyst following are associated with general material weakness remediations ($X^2 = 4.407$, $p = 0.018$), revealing the only instance of external governance as a factor explaining remediation.

V. CONCLUSION

Whether the new corporate governance regulations created by SOX and exchange listings are associated with internal control quality is likely of interest to company stakeholders and policy makers. In this study we examine whether changes in corporate governance characteristics are associated with internal control remediation for companies disclosing ICMWs under SOX Section 404 in 2004 and/or 2005. We provide evidence that internal control remediation occurs in conjunction with changes toward stronger

internal corporate governance, but not changes toward stronger external corporate governance. We find evidence that changes in internal governance as it relates to top management, board of directors, and audit committees are each incrementally significant, thereby illustrating the importance of each of these elements of corporate governance to the effective design and operation of internal controls. Finally, we find evidence that companies are less likely to remediate more pervasive internal control deficiencies.

The positive association between shifts towards more effective internal corporate governance and remediation support existing internal corporate governance regulations by SOX and the new listing requirements mandated by the exchanges. In particular, the results of this study support the audit committee regulations under SOX and the board independence regulations of the listing exchanges.

Our findings also have important implications for public policy to the extent that it appears internal corporate governance mechanisms play a more important role in remediating internal control deficiencies than external corporate governance mechanisms. Therefore, if further corporate governance regulations are enacted to restore investor confidence, our evidence indicates that regulations related to internal corporate governance will be most effective in improving internal controls. Specifically, based on the results of our tests, further exchange guidelines or public policy regulations made to improve internal controls could consider the following recommendations for boards of directors, audit committees, and top management. For boards of directors, recommendations include: increases in the number of independent board members, encouragement of board members to serve on other boards of directors, and required shareholdings in the company by board members. For audit committees,

recommendations include: the board chair, if independent, should serve on the audit committee, more than one audit committee member should be qualified as a financial expert, and audit committee members should have stockholdings in the company. For management, recommendations include: the CFO should have accounting experience, the CFO should have prior CFO experience, and the CEO should serve on other boards of directors.

Our results also have implications for small companies that have not yet been subject to SOX 404. In order to improve internal control quality before SOX 404 takes effect for them, small companies could consider internal governance improvements to aid in this process. Additionally, efforts by companies to improve internal controls via improved systems, training, and management oversight and monitoring should focus on controls related to personnel issues, closing issues, and control environment issues as these appear to be the most difficult to remediate.

References

- Agrawal, A. and S. Chadha. 2005. "Corporate Governance and Accounting Scandals." *Journal of Law and Economics*: October: v. 48(2), 371-406.
- Ashbaugh-Skaife, H., D. Collins, R. Kinney, and R. LaFond. 2006(a). "The effect of internal control deficiencies on firm risk and cost of equity capital." Working paper, University of Wisconsin.
- Ashbaugh-Skaife, H., D. Collins and R. Kinney. 2007. "The discovery and reporting of internal control deficiencies prior to SOX-mandated audits." *Journal of Accounting and Economics*: 44: 166-192.
- Baber, W., S. Kang and Lihong Liang. 2006. "Strong boards, external governance, and accounting restatement." Working paper, George Washington University.
- Becker, C., M. DeFond, J. Jiambalvo, and KR Subramanyam, 1998. "The Effect of Audit Quality on Earnings Management." *Contemporary Accounting Research*: 15: 1-24.
- Beasley, M. 1996. "An empirical analysis of the relation between the board of director composition and financial statement fraud." *The Accounting Review*: 71: 433-465.
- Beasley, M., J. Carcello, D. Hermanson, and P. Lapedes. 2000. "Fraudulent financial reportings: consideration of industry traits and corporate governance mechanisms." *Accounting Horizons*: 14: 441-454.
- Bedard, J., R. Hoitash, and U. Hoitash. 2007. "Regulatory intent and political reality: corporate governance and internal controls in the post-SOX world." Working Paper, Bentley College.
- Bedard, J., S. Chrourou, and L. Courteau. 2004. "The effect of audit committee expertise, independence, and activity on aggressive earnings management." *Auditing, A Journal of Practice and Theory*: 23 (2): 13-25.
- Bethel, J., J. Liebeskind, and T. Opler. 1998. "Block share purchases and corporate performance." *Journal of Finance*: 53: 605-634.
- Bushman, R. and Smith, A. 2001. "Financial accounting information and corporate governance." *Journal of Accounting and Economics*: 32: 237-333.
- Committee of Sponsoring Organizations of the Treadway Commission (COSO). 1992. "Internal Control – Integrated Framework." New York, NY: AICPA.

- Compliance Week. February 17, 2004. "SOX 404 Survey Confirms "Million Per Billion" Theory."
- Core, J., R. Holthausen, and D. Larcker. 1999. "Corporate governance, chief executive officer compensation, and firm performance." *Journal of Financial Economics*: 51: 371-406.
- Dechow, P., R. Sloan and A. Sweeney. 1996. "Causes and consequences of earnings manipulation: an analysis of firms subject to enforcement actions by the SEC." *Contemporary Accounting Research*: 13: 1-36.
- De Franco G.D.; Y. Guan, and H. Lu. 2005. "The wealth change and redistribution effects of Sarbanes-Oxley internal control disclosures." Working Paper, University of Toronto.
- Dey, A. 2004. "Corporate governance and financial reporting credibility." Working paper, Northwestern University.
- Doss, M. 2004. "Section 404 reports on internal control: impact on ratings will depend on nature of material weakness reported" (October). Moody's Special Comment. Moody's Investors Service, Inc.
- Doyle, B., W. Ge, and S. McVay. 2007. "Determinants of weaknesses in internal control over financial reporting." *Journal of Accounting and Economics*. 44: 193-223.
- Ettredge, M., C. Li, and L. Sun. 2006. "The Impact of SOX Section 404 Internal Control Quality Assessment on Audit Delay in the SOX Era." *Auditing, A Journal of Practice and Theory*: 25 (3): 1-23.
- Ettredge, M., J. Heintz, C. Li, and S. Scholz. 2007. "Auditor Realignment Accompanying Implementation of SOX 404 Reporting Requirements." Working paper, University of Kansas.
- Fargher, N. and A. Gramling. 2005. "Toward Improved Internal Controls: Early Remediation Actions Disclosed." *The CPA Journal*: 75:6: 26-29.
- Francis, J., E. Maydew and H.C. Sparks. 1999. "The Role of Big 6 Auditors in the Credible Reporting of Accruals." *Auditing: A Journal of Practice and Theory*:18(2): 17-34.
- Francis, J. and E. Wilson. 1988. "Auditor changes: a joint test of theories relating to agency costs and auditor differentiation." *The Accounting Review*: 63: 663-682.
- Gillan, S. 2006. "Recent Developments in Corporate Governance: an Overview." Forthcoming, *Journal of Corporate Finance*.

- Gupta, P., and N. Nayar. 2006. "Market reaction to control deficiency disclosures under the Sarbanes-Oxley Act: the early evidence." Presented at American Accounting Association Auditing Section Midyear Conference, Los Angeles.
- Hammersley, J., L. Myers and C. Shakespeare. 2008. "Market reactions to the disclosure of internal control weaknesses and to the characteristics of those weaknesses under Section 302 of the Sarbanes Oxley Act of 2002." *Review of Accounting Studies, forthcoming*.
- Hartzell, J. and L. Starks. 2003. "Institutional investors and executive compensation." *Journal of Finance*: 58: 2351-2374.
- Jensen, M. and W. Meckling. 1976. "Theory of the firm: managerial behavior, agency costs and ownership structure." *Journal of Financial Economics*: 3: 305-360.
- Jensen, K. and J. Payne. 2003. "Management trade-offs of internal control and external auditor expertise." *Auditing: A Journal of Practice & Theory*: 22: Issue 2: 99-119.
- Kinney, W.R, Jr. and L.S. McDaniel, 1989. "Characteristics of firms correcting previously reported quarterly earnings." *Journal of Accounting and Economics*: 11(February): 71-93.
- Klein, A. 2002. "Audit committee, board of director characteristics, and earnings management." *Journal of Accounting and Economics*: 33: 375-400.
- Knyazeva, D. 2007. "Corporate Governance, Analyst Following, and Firm Behavior" Working paper, University of Rochester.
- Krishnan, J. 2005. "Audit committee quality and internal control: an empirical analysis." *Accounting Review*: 72: 539-560..
- La Porta, R., Lopez de Silanes, F., Shleifer, A. and Vishny, R. 2000. "Investor Protection and Corporate Governance." *Journal of Financial Economics*: 58: 3-27.
- Larcker, D., S. Richardson, Seary, A., and I Tuna. 2005. "Back door links between executives and executive compensation." Working paper, University of Pennsylvania.
- Lee, Y., V. Mande, and R. Ortman. 2004. "The effect of audit committee and board of director independence on auditor resignation." *Auditing: A Journal of Practice & Theory*: 23: 29-46.
- Li, C., S. Scholz, and Q. Wang. 2007. "Internal Control over Financial Reporting: Is the Market Indifferent?" Working paper. University of Pittsburgh.

- Public Company Accounting Oversight Board (PCAOB). 2004. "Audit Standard No.2: An audit of internal control over financial reporting performed in conjunction with an audit of financial statements."
- Securities Exchange Commission (SEC). June 5, 2003. "Final rule: management's reports on internal control over financial reporting and certification of disclosure in exchange act periodic reports."
- Srinivasan, S. 2005. "Consequences of financial reporting failure for outside directors: evidence from accounting restatements and audit committee members." *Journal of Accounting Research*: 43: 2: 291-334.
- Teoh, S.H. and T.J. Wong. 1993. "Perceived auditor quality and the earning response coefficient." *The Accounting Review*: 68: 346-367.
- U.S. Congress. 2002. "Sarbanes-Oxley Act of 2002." One Hundred Seventh Congress of the United States of America: H.R. 3763.
- Vafeas, N.. 2005. "Audit committees, boards, and the quality of reported earnings." *Contemporary Accounting Research*: 22:4: 1093-1122.
- Yermack, D.. 2004. "Remuneration, retention, and reputation incentives for outside directors." *Journal of Finance*: 59: 2281-2308.
- Yu, F. 2007. "Analyst coverage and earnings management." Forthcoming, *Journal of Financial Economics*.
- Zhang, Y., J. Zhou and N. Zhou. 2007. "Audit Committee Quality, Auditor Independence, and Internal Control Weaknesses." *Journal of Accounting and Public Policy*: 26: 300-327.

Table 1
Sample Selection and Composition

Panel A: Internal Control Remediation Sample

Companies reporting ICMW in 2004 but not 2005	285
less: companies with missing proxy statement data	14
less: companies with missing Compustat data	<u>7</u>
Final Remediation Sample	<u>264</u>

Panel B: Internal Control No Remediation Sample

Companies reporting ICMWs in both 2004 and 2005	101
less: companies with missing proxy statement data	9
less: companies with missing Compustat data	<u>1</u>
Final No Remediation sample	<u>91</u>

Panel C: Composition of Sample, By Exchange

	IC Remediation		IC No Remediation	
	%	%	%	%
NYSE	98	37%	37	41%
AMEX	21	8%	6	7%
NASDAQ	141	53%	47	52%
OTC	4	2%	1	1%
Total	<u>264</u>	<u>100%</u>	<u>91</u>	<u>100%</u>

Panel D: Composition of Sample, By Auditor

	IC Remediation		IC No Remediation	
	%	%	%	%
Big 4	218	83%	73	80%
National	29	11%	11	12%
Regional	17	6%	7	8%
Total	<u>264</u>	<u>100%</u>	<u>91</u>	<u>100%</u>

(continued on next page)

Table 1 (continued)

Panel E: Composition of Sample, By Industry Classification

Industry	2-Digit SIC Code	Remediation	%	No Remediation	%	X²	p-value
Natural resources	0-14	14	5%	5	5%	0.005	0.944
Construction and metal	15-19, 30, 32-34	12	5%	1	1%	2.821	0.093
Food	20-21	0	0%	1	1%	2.909	0.088
Consumer goods	22-23, 25, 31, 39	6	2%	1	1%	0.482	0.487
Paper and printing	24, 26-27	5	2%	4	4%	1.714	0.190
Chemical and petroleum	28-29	16	6%	6	7%	0.033	0.856
Machinery and equipment	35-36, 38	42	16%	17	19%	0.375	0.540
Transportation related	37, 40-47	4	2%	4	4%	2.549	0.110
Utilities and telecommunications	48-49	23	9%	8	9%	0.001	0.982
Wholesale and retail	50-59	40	15%	9	10%	1.575	0.210
Financial services	60-69	57	22%	9	10%	6.122	0.013
Entertainment	78-79	4	2%	1	1%	0.084	0.771
Business services	73,81	32	12%	18	20%	3.281	0.070
Health and other services	70,72, 75-76, 80, 82-89	9	3%	7	8%	2.885	0.089
Total		264	100%	91	100%		

Table 2
Variable Definitions

Variable	+/-	Definition
Dependent Variable		
ICIMPROVE		Equals one if a company reports remediation in 2005; zero if a company continues to report ICMWs in 2005.
GENERAL IMPROVE		Equals one for companies reporting general ICMWs in 2004 and reporting internal control remediation in 2005, and equals zero for companies reporting general ICMWs in 2004 but reporting no remediation in 2005.
External Governance Characteristics		
Δ BIG4	+	Equals one (negative one) if the company changed to a Big 4 (non-Big 4) auditor from a non-Big 4 (Big 4) auditor; zero otherwise.
Δ BLOCK	+	Change in the proportion of blockholdings of common stock.
Δ ANALYST	+	Change in the average number of analysts following the company.
Internal Governance Characteristics		
Board of Director		
Δ INDEPDIR	+	Change in the proportion of independent directors on board.
Δ DIRCHAIR	+	Equals one (negative one) if the chair of the board changed from a non-independent (independent) director to an independent (non-independent) director; zero otherwise.
Δ IDIRTENURE	+	Change in the natural log of the average independent director tenure.
Δ IDIRBOD	+	Change in the percentage of independent directors who also serve on other companies' board.
Δ IDIRSHR	+	Change in the percentage of the total shareholdings of independent directors.
Audit Committee		
Δ ACCHAIR	+	Equals one (negative one) if the chair of the board changes from a non-audit (audit) committee member to an audit (non-audit) committee member; zero otherwise.
Δ ACEPERT	+	Change in the number of audit committee financial experts.
Δ ACSHR	+	Change in the percentage of shareholdings of audit committee members

Table 2 (continued)

Variable	+/-	Definition
<i>Management</i>		
ΔCFOACCTEXP	+	Equals one (negative one) if the prior experience of the CFO changed from not having (having) experience as a CPA or as a public accounting firm accountant to having (not having) experience as a CPA or public accounting firm accountant, and zero otherwise.
ΔCFOTENURE	+	Change in the natural log of number of years the CFO has been employed as a CFO.
ΔCEOBOD	+	Change in the total number of boards on which the CEO serves.
<i>Material Weakness Characteristics</i>		
GENERAL	-	Equals one if the ICMW has a pervasive effect at the company-level; zero if the ICMW is related to a specific non-pervasive control.
NUMBER	-	Equals the total number of ICMWs reported.
<i>Company Business Characteristics</i>		
ΔGROWTH	-	Sales growth from 2004 to 2005 [(Compustat data #12 ₂₀₀₅ - data #12 ₂₀₀₄) / data #12 ₂₀₀₄].
ΔLEVERAGE	-	Change in leverage from 2004 to 2005 [total debt (Compustat #9 + #34) / total assets (data #6)].
ΔROA	+	Change in the return on assets from 2004 to 2005 [(net income (Compustat data #172)/total assets (data #6)].
ΔSEGMENT	-	Change in the natural log of number of business segments reported in SEC Form 10-K.
ΔRESTRUCT	-	Equals one (negative one) if a company changes from not engaging (engaging) in restructuring to engaging (not engaging) in restructuring (non-zero values of Compustat data items #376, #377, #378, or #379); zero otherwise.

Table 3
Descriptive Statistics

Variables:	2004			2005			Change t-stat
	<i>ICIMPROVE=1</i>	<i>ICIMPROVE=0</i>	t-stat	<i>ICIMPROVE=1</i>	<i>ICIMPROVE=0</i>	t-stat	
	Mean (N = 264)	Mean (N = 91)		Mean (N = 264)	Mean (N = 91)		
<i>Outside Governance</i>							
BIG4	0.826	0.802	0.503	0.727	0.648	1.427	1.401
BLOCK	0.296	0.342	-1.775*	0.285	0.311	-1.075	0.988
ANALYST	5.111	4.487	0.941	5.389	4.835	0.858	-0.295
<i>Inside Governance</i>							
<i>Board of Directors</i>							
INDEPDIR	0.769	0.744	1.912*	0.775	0.734	3.191***	1.998**
IDIRCHAIR	0.455	0.407	0.793	0.462	0.429	0.553	-0.558
IDIRTENURE	1.723	1.610	1.648	1.838	1.718	2.078**	0.279
IDIRBOD	0.426	0.399	0.853	0.507	0.324	6.163***	7.878***
IDIRSHR	0.030	0.030	-0.028	0.027	0.014	2.390**	2.670***
<i>Audit Committee</i>							
ACCHAIR	0.080	0.099	-0.571	0.125	0.066	1.555	2.456**
ACEXPERT	1.189	1.385	-1.908*	1.405	1.154	2.511**	6.280***
ACSHR	0.010	0.009	0.091	0.009	0.006	1.705*	2.087**
<i>Top Management</i>							
CFOACCTEXP	0.314	0.319	-0.076	0.436	0.297	2.344**	2.904***
CFOTENURE	1.509	1.358	1.376	1.759	1.413	3.416***	2.637***
CEOBOD	0.288	0.297	-0.160	0.330	0.154	3.242***	4.527***
<i>Characteristics of ICMW</i>							
GENERAL	0.371	0.582	-3.567***	n/a	n/a	n/a	n/a
NUMBER	1.754	3.451	-6.754***	n/a	n/a	n/a	n/a
<i>Business Characteristics</i>							
GROWTH	0.249	0.302	-0.466	0.194	0.089	2.217**	1.423
LEVERAGE	0.234	0.192	1.447	0.190	0.177	0.496	-1.815*
ROA	-0.018	-0.028	0.484	-0.005	-0.065	2.497**	2.443**
SEGMENT	0.523	0.653	-1.595	0.666	0.779	-1.370	0.294
RESTRUCT	0.239	0.297	-1.097	0.292	0.352	-1.068	-0.038

See Table 2 for variable definitions. The following symbols indicate significant effects: * = < 0.10; ** = < 0.05; *** = < 0.01 in two-tailed tests.

Table 4
Pearson Correlations

	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.	22.			
1.ICIMPROVE	0.074	0.053	-0.016	0.106	-0.030	0.015	0.387	0.141	0.130	0.317	0.110	0.153	0.139	0.234	-0.220	-0.338	0.076	-0.096	0.129	0.016	-0.0			
2. ΔBIG4		0.042	-0.048	0.101	-0.022	-0.077	-0.044	0.110	0.033	-0.013	0.085	0.093	-0.027	0.045	-0.127	-0.188	0.035	-0.040	-0.053	0.007	-0.0			
3. ΔBLOCK			-0.084	0.016	-0.038	-0.058	0.029	0.149	0.002	0.021	0.114	0.102	-0.044	-0.004	-0.011	0.044	0.086	0.073	-0.063	-0.057	-0.0			
4. ΔANALYST				-0.012	-0.041	0.027	0.048	-0.098	-0.038	0.159	-0.087	-0.073	0.013	0.062	-0.022	-0.014	-0.018	-0.076	-0.127	0.055	-0.0			
5. ΔINDEPDIR					-0.055	-0.025	-0.078	0.308	0.120	0.059	-0.098	0.071	-0.085	0.083	-0.015	-0.010	-0.075	-0.090	0.010	0.021	0.00			
6. ΔDIRCHAIR						-0.004	-0.013	0.019	0.096	-0.009	0.035	-0.043	0.018	-0.115	-0.045	-0.011	-0.011	-0.010	-0.027	0.100	0.02			
7. ΔDIRTENURE							-0.018	0.212	-0.120	-0.090	0.107	-0.085	-0.004	-0.087	0.083	0.106	-0.117	0.040	0.082	-0.030	-0.0			
8. ΔDIRBOD								-0.021	0.047	0.135	0.051	0.019	0.068	0.177	-0.057	-0.178	0.061	-0.064	0.008	0.004	-0.0			
9. ΔDIRSHR									0.052	-0.061	0.183	0.058	0.114	0.043	-0.007	0.000	-0.047	-0.045	0.014	0.038	0.08			
10. ΔACCHAIR										0.054	0.022	0.006	-0.074	0.002	-0.017	-0.081	-0.119	-0.067	0.086	0.040	0.05			
11. ΔACEXPRT											-0.093	0.055	0.051	0.096	-0.010	-0.158	0.013	-0.109	0.080	0.004	-0.0			
12. ΔACSHR												0.021	0.016	0.013	-0.042	-0.030	-0.005	0.003	-0.086	0.063	-0.0			
13. ΔCFOACCTEXP														-0.070	0.063	0.006	-0.021	-0.072	0.002	0.016	0.024	-0.0		
14. ΔCFOTENURE															0.071	-0.097	-0.046	0.048	-0.045	0.038	0.040	0.01		
15. ΔCEOBOD																-0.019	-0.021	-0.016	-0.053	0.001	-0.011	-0.0		
16.GENERAL																			0.396	-0.022	-0.005	-0.047	0.096	0.00
17.NUMBER																				-0.063	0.098	-0.071	0.026	-0.0
18.ΔGROWTH																					-0.143	0.213	0.011	-0.0
19. ΔLEVERAGE																						-0.200	-0.103	0.00
20. ΔROA																							0.024	-0.0
21. ΔSEGMENT																								0.00
22. ΔRESTRUCT																								0.00

Note: See Table 2 for variable definitions. Correlations in bold are significant at $p < 0.05$ in two-tailed tests.

Table 5
Logistic Regression Results

Variables:	+/-	<u>Model 1a</u>		<u>Model 1b</u>		<u>Model 1c</u>		<u>Model 1d</u>		<u>Model 1e</u>		<u>Model 1f</u>	
		Coeff.	Wald X ²	Coeff.	Wald X ²	Coeff.	Wald X ²	Coeff.	Wald X ²	Coeff.	Wald X ²	Coeff.	Wald X ²
Intercept		0.159	0.093	0.179	0.078	0.474	0.517	0.502	0.451	1.666	4.407**	1.738	4.339**
<i>External Governance</i>													
ΔBIG4	?	0.381	1.079	0.564	1.906	0.628	1.950	0.590	1.487	0.085	0.025	0.128	0.056
ΔBLOCK	+	1.024	1.776*	0.398	0.212	0.155	0.027	0.532	0.298	0.923	0.717	1.109	1.000
ΔANALYST	+	-0.030	0.222	-0.052	0.482	-0.139	2.443	-0.138	2.175	-0.151	2.372	-0.143	2.033
<i>Internal Governance</i>													
<i>Board of Directors</i>													
ΔINDEPDIR	+			5.023	4.511**	3.795	2.090*	4.403	2.536*	5.781	3.794**	5.995	3.978**
ΔIDIRCHAIR	+			0.121	0.029	-0.076	0.011	0.336	0.188	0.423	0.256	0.323	0.142
ΔIDIRTENURE	+			0.142	0.046	0.683	0.866	1.210	2.361*	1.562	3.383**	1.826	3.403**
ΔIDIRBOD	+			8.179	45.281***	8.667	40.809***	8.548	36.877***	8.649	31.736***	8.776	30.791***
ΔIDIRSHR	+			7.103	2.798**	9.713	4.620**	7.486	2.583*	6.321	1.942*	5.942	1.676*
<i>Audit Committee</i>													
ΔACCHAIR	+					1.361	3.639**	1.556	4.159**	1.733	4.798**	1.797	4.943**
ΔACEXPERT	+					2.184	27.663***	2.290	26.951***	2.212	22.396***	2.251	22.038***
ΔACSHR	+					23.938	2.442*	23.713	2.402*	25.635	2.621*	27.370	3.124**
<i>Top Management</i>													
ΔCFOACCTEXP	+							0.806	3.416**	0.788	3.089**	0.908	3.712**
ΔCFOTENURE	+							0.682	5.372***	0.735	5.835***	0.713	5.132**
ΔCEOBOD	+							1.399	6.958***	1.694	8.749***	1.904	10.283***
<i>Characteristics of ICMW</i>													
GENERAL	-									-0.764	3.980**	-0.773	3.796**
NUMBER	-									-0.333	9.074***	-0.324	8.411***
<i>Business Characteristics</i>													
ΔGROWTH	-											0.218	1.236
ΔLEVERAGE	-											-1.427	0.586
ΔROA	+											0.985	0.809
ΔSEGMENT	-											0.263	0.494
ΔRESTRUCT	-											0.376	0.710
Chi-Square		16.71*		91.06***		138.40***		157.62***		184.32***		189.15***	
Pseudo R ²		0.068		0.333		0.475		0.528		0.596		0.608	
Δ in Pseudo R ² Significance (p-val.)				0.000		0.000		0.000		0.000		0.478	

Note: The dependent variable, ICIMPROVE, equals one if a company reports remediation in 2005; zero if a company continues to report ICMWs in 2005. Values in the table represent the coefficient, followed by the p-value. Reported p-values are one-tailed for directional expectations, and two-tailed otherwise. See Table 2 for independent variable definitions.

Table 6
Descriptive Statistics on Material Weakness Categorized by COSO Framework

	Remediation Sample (N = 264)			No Remediation Sample (N = 91)			(g) (c) vs. (f)
	(a)	(b)	(c)	(d)	(e)	(f)	
		Frequency: % of	Frequency: % of Companies		Frequency: % of	Frequency: % of Companies With Weakness	
	Count	Total Weaknesses	With Weakness Type	Count	Total Weaknesses	Type	p-val.
Personnel	78	17%	30%	50	20%	55%	0.000
Segregation of duties	51	11%	19%	32	12%	35%	0.003
Documentation	36	8%	14%	23	9%	25%	0.017
IT	18	4%	7%	19	7%	21%	0.000
Design/Process	194	43%	73%	75	29%	82%	0.141
Closing	58	13%	22%	40	16%	44%	0.000
Environment	13	3%	5%	18	7%	20%	0.000
Total	448	100%		257	100%		

Note: This table displays the frequency of each of the COSO Framework categories of material internal control weaknesses as a percent of total identified ICMW for the Remediation Sample (column b) and the No Remediation Sample (column e). Also tabulated are the frequency of the number of firms that report each type of ICMW for the Remediation Sample (column c) and the No Remediation Sample (column f). The p-value for the test of differences between the Remediation and No Remediation Sample is included in column (g).

Table 7
Additional Analysis for Material Weakness Types and Category

Variables	<u>Model (2)</u>		<u>Model (3)</u>	
	DV = ICIMPROVE		DV = GENERAL IMPROVE	
	Coeff.	Wald X^2	Coeff.	Wald X^2
Intercept	2.483	5.695	2.096	22.375
PERSONNEL	-0.832	3.860**		
SEGDUTY	-0.143	0.093		
DOCUMENT	-0.387	0.553		
IT	-0.192	0.079		
DESIGN/PROCESS	-0.662	2.006		
CLOSING	-0.813	3.905**		
ENVIRONMENT	-2.014	6.755***		
ΔBIG4	? -0.008	0.000	0.334	0.222
ΔBLOCK	+ 1.016	0.836	0.892	0.192
ΔANALYST	+ -0.241	4.951**	0.319	4.407**
ΔINDEPDIR	+ 6.791	4.838**	5.547	1.695*
ΔIDIRCHAIR	+ 0.197	0.046	-0.056	0.000
ΔIDIRTENURE	+ 1.627	2.793**	0.223	0.032
ΔIDIRBOD	+ 8.910	29.910***	2.522	2.546*
ΔIDIRSHR	+ 7.360	2.115*	-2.358	0.079
ΔACCHAIR	+ 1.863	5.546**	1.185	1.439
ΔACEXPRT	+ 2.533	26.094***	0.576	1.102
ΔACSHR	+ 21.678	1.588	37.773	2.024*
ΔCFOACCTEXP	+ 0.854	3.173**	-0.962	2.626
ΔCFOTENURE	+ 0.771	4.630**	0.620	1.896*
ΔCEOBOD	+ 2.174	11.305***	0.841	0.942
ΔGROWTH	- 0.170	0.582	0.290	0.990
ΔLEVERAGE	- -0.238	0.015	3.750	3.144*
ΔROA	+ 0.882	0.651	2.086	2.589*
ΔSEGMENT	- 0.416	1.049	0.632	0.930
ΔRESTRUCT	- 0.467	1.018	1.143	1.947
ICMW: N =	91		No Improve: N = 24	
IC Effective: N =	264		Improve: N = 125	
Chi-Square	196.893		34.389	
Pseudo R ²	0.623		0.277	

Note: For Model 2 (full sample), the dependent variable, ICIMPROVE, is equal to one for companies reporting remediation in 2005, equal to zero otherwise. For Model 3 (sample restricted to companies reporting general ICMWs), the dependent variable is equal to one for companies reporting remediation in 2005, and zero otherwise. Reported p-values are one-tailed for directional expectations, and two-tailed otherwise. See Table 2 for independent variable definitions.