



Corporate ownership characteristics and timeliness of remediation of internal control weaknesses

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Abstract

Purpose – The purpose of the paper is to examine the association between the corporate ownership characteristics and the timely remediation of internal control weaknesses over financial reporting under Section 404 of the Sarbanes-Oxley Act (SOX) of 2002.

Design/methodology/approach – The paper employs both ordered and binary logistic regression models for a sample of 695 US firms who reported internal control weaknesses for the first time, pursuant to SOX Section 404, and evaluates the impact of the stock ownership characteristics on the timeliness in remediation of their control weaknesses.

Findings – The test results show that the corporate ownership characteristics, as a part of governance mechanism, play an incrementally critical role to influence firms' decisions to promptly remediate their internal control problems and improve the reliability of financial information. In addition, it was also found that a corporate board independent of its CEO is effective in monitoring timely remediation of control problems. Sub-sample analyses for the company-level and account-specific internal control weaknesses produce similar results in support of the effect of corporate stock ownership characteristics on the timely remediation of internal control weaknesses.

Originality/value – First, the paper adds to the literature by demonstrating the incremental effect of the stock ownership characteristics on a firm's timeliness in remediation of control weaknesses, even after controlling the effect of audit committee and board characteristics in the analysis. Second, the paper shows that even in the post-SOX years with enhanced regulatory oversight in corporate affairs, the effect of corporate ownership attributes as a part of governance is incrementally observable in a situation that calls for prompt managerial action to ensure the reliability of financial information. Third, for the first time, the study makes a separate detailed analysis on the association between the stock ownership attributes and the remediation of company-level and account-specific control weaknesses. The results provide valuable insights into the ownership governance effect on the remediation of the two types of control weaknesses that have different rigor, auditability (more or less auditable), and effects (pervasive or non-pervasive) on financial reporting quality. Fourth, the study further enhances one's understanding of several important governance factors that help achieve a sound financial reporting system and restore investors' confidence in the system.

Keywords United States of America, Financial reporting, Shareholders, Corporate governance, Sarbanes-Oxley, Stock ownership characteristics, Remediation of internal control weaknesses, Systematic and non-systematic internal control weaknesses, Managerial stock ownership, Diffused and concentrated institutional ownership, Non-institutional blockholder ownership, Board and audit committee characteristics

Paper type Research paper



Introduction

This study examines the association between stock ownership characteristics and the timely remediation of internal control weaknesses (ICW) over financial reporting under Section 404 of the Sarbanes-Oxley Act of 2002 (hereinafter, SOX 404). The heightened attention to internal controls has led to a series of empirical research on internal controls and reported earnings quality (Altamuro and Beatty, 2010; Ashbaugh-Skaife *et al.*, 2008; Chan *et al.*, 2008; Doyle *et al.*, 2007a). These studies document that weak internal controls lead to low-quality accounting accruals from intentional misstatements and unintentional accounting errors. ICW adversely impact the quality of accounting information, whereas their remediation leads to an increase in reported information quality (Ashbaugh-Skaife *et al.*, 2008). Since ineffective internal control enhances the risk of financial misreporting, the timely remediation of internal control problems is critical from all stakeholders' points of view.

Prior studies examine the effect of a firm's governance mechanism on the disclosure and remediation of ICW. For example, Hoitash *et al.* (2009) find that a lower likelihood of disclosing ICW under SOX 404 is associated with relatively more audit committee members having accounting and supervisory experience, as well as board strength. Goh (2009) documents that several board and audit committee characteristics are associated with timely remediation of ICW, while Li *et al.* (2010) find that the hiring of a better-qualified CFO leads to SOX 404 opinion improvement. Furthermore, Johnstone *et al.* (2011) demonstrate that changes in various board, audit committee and CFO attributes are associated with the remediation of ICW.

It is important, however, to have a complete understanding of the role that the different facets of corporate governance play in this crucial managerial action, because prompt remediation of control problems sends a strong signal to financial statement users that the firm is committed to restoring a credible financial reporting process. For this reason, we consider an important yet unaddressed aspect of corporate governance, i.e. stock ownership characteristics, and investigate their relationships with the timeliness of ICW remediation because prior research (Warfield *et al.*, 1995; Bushee, 1998; Dechow *et al.*, 1996; Chung *et al.*, 2002; Mitra and Cready, 2005) demonstrates that corporate ownership structure itself constitutes an important part of an organisation's governance system[1].

Corporate governance refers to a set of mechanisms that influence managerial decisions in a corporate setting, where there is a separation of ownership and control, a situation that gives rise to agency problems in varying degrees depending on the extent of managerial stock ownership and the alignment of manager-shareholder interests. It is therefore difficult to conceive of a situation where corporate governance is not relevant in understanding managerial behavior. Several studies examine the impact of governance structure on executive behavior and organizational performance (Byrd and Hickman, 1992; Brickley *et al.*, 1994; Core *et al.*, 1999; Klein, 2002; Chung *et al.*, 2002; Xie *et al.*, 2003; Gompers *et al.*, 2003) and mostly document that governance mechanisms have a significant effect on a firm's strategic decision and performance[2].

We further extend our analysis to two types of ICW, that is, company-level pervasive control weaknesses and account-specific non-pervasive control weaknesses, and separately examine the association between stock ownership characteristics and timely remediation of these two control weaknesses. This analysis may provide further insights into the role of ownership constructs in high versus low reporting risk

situations, because the company-level ICW are less auditable and more pervasive in nature, which leads to greater distortion of reported earnings than the account-specific ICW (Doyle *et al.*, 2007a). Moreover, the cost of remedying the company-level ICW is likely to be much greater than the cost of remedying the account-specific ICW for firms with the same size and complexity[3]. Both Moody's Investors Service (2004) and Fitch Ratings (2005) are more concerned about the credit quality of companies that have the company-level ICW. Moody's Investors Service (2004) suggests that the existence of the company-level ICW calls into question not only management's ability to prepare accurate financial reports but also its ability to effectively control the business.

Our study considers five ownership-characteristic variables as the variables of interest in the analysis: managerial stock ownership; diffused institutional stock ownership; concentrated institutional stock ownership; non-institutional blockholder ownership; and percentage stock ownership by dominant shareholders. Several board and audit committee-related governance variables (as used in prior studies) along with firm-characteristic variables are included as controls. Our sample includes the firms that reported ICW for the first-time pursuant to SOX 404 as identified in their auditors' attestation reports for the fiscal year-end after November 15, 2004 through December 31, 2006. Our timely remediation measures are FAST, SLOW, and NO: FAST remediation takes place at the time of the first SOX 404 report after the year of first ICW reporting; SLOW remediation takes place at the time of the second SOX 404 report after the year of first ICW reporting; and NO remediation means control weaknesses are not remedied within two years after their first reporting. First, we apply an ordered logistic regression model to investigate the association between the ownership-characteristic variables and the timeliness of ICW remediation. Second, we apply binary logistic models to make comparative analyses such as FAST versus NO remediation, SLOW versus NO remediation, and FAST versus SLOW remediation, to examine the associations between the ownership characteristics and alternative measures of timeliness in ICW remediation. Third, we partition our sample into two groups of firms, with company-level and account-specific ICW, and re-estimate the ordered logistic regression models.

Our empirical results indicate that managerial stock ownership, concentrated institutional stock ownership, non-institutional blockholder ownership, and dominant shareholdings are significantly positively associated with the timeliness of the ICW remediation. These results are relatively consistent across our various tests. The results suggest that stock ownership attributes play an incrementally effective governance role in influencing a firm's decision to promptly remediate its internal control problems. Managers become more engaged in producing financial statements that communicate more reliable information when they hold a larger percentage of a company's stock. Since they may have a large portion of their wealth tied to the future prospects of the corporation, they are likely to take timely action to remediate material weaknesses to improve the reliability of reported financial information. Concentrated institutional owners, non-institutional blockholders, and dominant shareholders have sufficient resources and ability to effectively monitor their investments. When they have substantial financial stakes in an entity, they are likely to influence management to timely remediate ICW to improve reporting quality.

The study contributes to the literature by demonstrating the incremental effect of stock ownership characteristics on the timeliness of the ICW remediation after controlling for the effect of audit committee and board characteristics in the analysis.

Even in the post-SOX period with enhanced regulatory oversight on corporate affairs, the effect of corporate ownership attributes as a part of governance is incrementally observable in a situation that calls for prompt managerial action to restore the reliability of financial information. In this respect, the study complements other, related studies on corporate governance and ICW (Johnstone *et al.*, 2011; Li *et al.*, 2010; Goh, 2009; Ashbaugh-Skaife *et al.*, 2008; Corporate Governance, 2012). Furthermore, for the first time, the study performs separate analyses of the association between the stock ownership attributes and the remediation of the company-level and account-specific ICW. The results provide additional insights into the ownership-related governance effect on the remediation of these two types of ICW that have different rigor, auditability (more or less auditable), and effects (pervasive or non-pervasive) on financial reporting quality. Finally, the study enhances our understanding of the effect of certain governance characteristics that help achieve a sound financial reporting system and restore investors' confidence in the system.

The remainder of the paper is organized as follows. We have background discussion, hypotheses, research design, and discussion of the sample selection process that are included in the next four sections. Then, in subsequent sections, we describe the data and correlation statistics and report the results of our empirical analyses. The final section contains our concluding discussion.

Background discussion

The Public Company Accounting Oversight Board (2004) maintains that the reliability of financial reporting is a function of the effectiveness of a firm's internal controls. Ashbaugh-Skaife *et al.* (2008) argue that if a firm has weak internal controls, managers are not able to make reliable accrual estimates necessary to produce high-quality earnings and other financial information. In such a situation, the ICW lead to unintentional errors in financial reports. Moreover, a weak internal control system creates opportunity for managers to make biased accrual estimates and intentionally misstate earnings and other financial information to achieve self-serving interests. In both cases, the low-quality accruals lead to distorted financial statement information. Therefore, ICW need to be remedied in order to alleviate the possibility of both intentional and unintentional misstatements in financial reporting.

Prior research findings also support this notion that improved internal controls reduce uncertainty surrounding the financial reporting process. Doyle *et al.* (2007a) and Ashbaugh-Skaife *et al.* (2008) document positive relationships between internal control quality and accruals quality as measured by the extent to which accruals are realized in cash flows or by the reduction of abnormal accruals. Goh and Li (2011) recently observe that strong internal controls serve as a mechanism that facilitates accounting conservatism thus improving contracting efficiency. They further observe that remediation of control weaknesses at the time of second SOX 404 reports is associated with greater conservatism. Furthermore, Ashbaugh-Skaife *et al.* (2009) show that effective internal control yields benefit through lower information risk that translates into lower cost of equity. All these findings point toward the importance of timely remediation of ICW in financial reporting[4].

In view of the critical role of internal controls in the financial reporting process, several recent studies focus on the remediation of ICW and examine whether corporate governance characteristics are associated with management's remediation action.

Goh (2009) investigates the effect of board and audit committee characteristics and CEO attributes on the timeliness in remediation of Section 302 ICW that were disclosed between July 2003 and December 2004. He finds that three corporate governance variables – proportion of independent board members, proportion of audit committee members having non-accounting financial expertise, and audit committee size – are positively, significantly related to the timeliness in the ICW remediation. Li *et al.* (2010) document that the recipients of adverse SOX 404 opinions experience more CFO turnover in subsequent years. These firms are more likely to hire CFOs with improved qualifications. As a result, a SOX 404 opinion improves in later years. The authors find a positive influence of newly hired CFOs' professional qualifications on the improvement of internal control quality. Johnstone *et al.* (2011) find a positive relationship between ICW remediation and improvements in the characteristics of the board of directors, audit committees and top management. They demonstrate that the ICW remediation is positively associated with an increase in the proportion of independent directors on the board; an increase in the percentage of independent directors who also serve on other boards; changes involving having an audit committee member chairing the board; improvements in the audit committee's financial expertise; and an increase in percentage shareholdings of audit committee members. Further, their results show that the ICW remediation is positively associated with changes toward CFOs with greater accounting expertise, greater CFO-specific work experience, and improvements in CFO reputation.

Previous studies examine the effect of corporate governance attributes on financial reporting quality (Warfield *et al.*, 1995; Dechow *et al.*, 1996; Gillan and Starks, 2000; Chung *et al.*, 2002; Klein, 2002; Xie *et al.*, 2003; Vafeas, 2005; Mitra and Cready, 2005) and demonstrate that firms' governance characteristics, namely, board and audit committee characteristics and stock ownership attributes, are significantly associated with the reduction of opportunistic earnings (accruals) management. Corporate governance is viewed as a mechanism that essentially helps improve the reliability of reported accounting information. Thus, when a firm's internal control over financial reporting is reported to be problematic, its governance mechanism as a part of the overall corporate monitoring process is most likely to influence management's decision to take corrective action to remediate control problems to improve reporting quality[5].

We argue that how quickly and effectively a firm can resolve its internal control problem primarily depends on management's willingness, ability, and sense of urgency to address the issue. Two sets of factors are likely to interact with each other to either expedite or delay the ICW remediation process. The first set of factors relates to the governance attributes of a firm that includes board and audit committee's independence and effectiveness, board and audit committee diligence, a CEO-independent board and stock ownership characteristics. The second set of factors includes firm characteristics, such as visibility, growth, financial strength, the number of ICW reported, and operating complexity. All these factors, in varying degrees, are deemed to influence management to take corrective actions to resolve control problems in a timely manner.

Hypotheses

Managerial stock ownership and timeliness of remediation of ICW

Jensen and Meckling (1976) suggest that managerial ownership is an essential factor to resolve agency conflict. When there is a separation between ownership and control, managers work more toward achieving self-serving interests[6]. Jensen and Meckling

(1976) contend that managers with high ownership interests are less likely to engage in opportunistic accruals management for short-term gains and are more likely to produce financial statements to communicate value-relevant information. Warfield *et al.* (1995) observe that with an increase in managerial stock ownership, a greater proportion of managerial wealth is tied to the long-term value of a firm, which leads to greater alignment of manager-shareholder interests. Consistent with this notion, prior studies further demonstrate that the financial reporting problem diminishes with an increase in managerial stock ownership (Gul *et al.*, 2003; Warfield *et al.*, 1995)[7]. In a recent study, LaFond and Roychowdhury (2008) hypothesize that when managerial stock ownership declines, the severity of agency problems increases, which increases the demand for accounting conservatism. They argue that if conservatism plays a role in addressing agency problems between managers and shareholders, the less the alignment of interests between managers and shareholders, and the greater the demand for conservatism, *ceteris paribus*. Consistent with this notion, they find that conservatism declines with increases in managerial stock ownership. These research observations highlight the differential impact of low versus high managerial stock ownership on reported information quality.

Since internal control quality is a critical factor to ensure reliable financial information, managers with high ownership stakes in the ICW firms are probably more inclined to take prompt action to remediate control problems to improve reporting quality. We predict that high ownership interest in an entity encourages managers to become more engaged in resolving uncertainty surrounding the financial reporting process, which includes their efforts to timely remediate internal control problems and improve the reliability of financial information. Therefore, an increase in managerial stock ownership increases the likelihood that the ICW remediation takes place in a timely manner[8]. This prediction is expressed in form of the following alternative hypothesis:

H1a. Ceteris paribus, the higher the managerial stock ownership, the greater is the likelihood that the firms remediate their ICW in a timely manner.

Institutional and large shareholder stock ownership and timeliness of remediation of ICW

The institutional investors, on average, are better informed than individual investors because of their large-scale development and analysis of timely and valuable firm-specific information (Balsam *et al.*, 2002; Jiambalvo *et al.*, 2002; Wahal and McConnell, 2000). To satisfy their fiduciary responsibilities, institutions develop a prudent and selective investment policy and continuously monitor their portfolio performance. Institutional investors can promote their investment objectives by introducing motions and proposals at annual meetings to counter management policies (Hessel and Norman, 1992).

Duggal and Millar (1999) argue that a large financial stake in the corporation provides economic incentives for institutional managers to monitor firm performance to maximize their investment value and the marketability of their interest. Recent research supports this view. Chung *et al.* (2002) find that a substantial institutional presence in a firm's shareholder mix inhibits managers from opportunistically engaging in income smoothing. Moreover, the fear of antagonizing a few large and influential shareholder groups could encourage managers to act in the best interest of shareholders. In this respect, Kane and Velury (2004) suggest that large institutional investors use their

substantial voting rights to influence management's strategic decisions. They argue that the mere potential to use voting power, as opposed to actual use, allows institutions and other large shareholders to influence management. Further, Monks and Minow (1995) contend that institutional investors have the opportunity, ability, and resources to monitor, discipline, and influence a firm's managers[9]. As institutions' ownership has increased, their role as shareholders has also evolved. Institutional shareholders such as public pension funds and union pension funds began to abandon their traditional passive shareholder role and became more active participants in the governance of their corporate holdings (Monks and Minow, 1995). Bartov *et al.* (2000) observe that institutional investors reduce the post-earnings announcement drift in stock prices, while Jiambalvo *et al.* (2002) document that the extent to which stock prices lead earnings is positively related to institutional stock ownership. With an increase in institutional stock ownership, stock prices tend to reflect a greater proportion of the information on future earnings relative to current earnings. These results indicate that an increase in institutional investment is associated with a corresponding reduction of information asymmetry between managers and shareholders[10].

According to Shleifer and Vishny (1997), ownership concentration itself is an important determinant of effective corporate governance. Monitoring by large shareholders determines the adequacy of corporate governance and is likely to impact a firm's inherent risk of misstatements in reported financial statements. Prior studies also demonstrate that large shareholders have incentives to undertake monitoring and other costly control activities, as it is most likely that the incremental benefits from doing so exceed the associated costs (Grossman and Hart, 1980; Shleifer and Vishny, 1986; Huddart, 1993; Gillan and Starks, 2000)[11]. Jensen and Meckling (1976) suggest that large shareholder activism seems to intensify when ownership becomes concentrated in the hands of such investors. Jensen (1993) further argues that large shareholders (defined as individuals or institutions that simultaneously hold large debt and/or equity positions) tend to actively participate in companies' strategic decisions[12].

Substantial investment in a firm makes portfolio governance and its long-term value maximization an overriding concern for large shareholders. Considering the role that the large and institutional shareholders intend to play in corporate affairs and the fact that the financial statement information provides a major basis for evaluating their portfolio performance and financially monitoring the companies in which they largely invest, a fair presentation of financial information, in all material respects, is critically important to such large shareholders including institutional stockowners. When the financial reporting problem of the investee corporations associated with ineffective internal controls becomes formally evident or available via auditors' SOX 404 reports to those large shareholders, they are most likely to induce management to take prompt corrective action to remediate ICW. This is done in order to mitigate a potentially risky situation associated with unintentional errors and intentional accounting adjustments and restore the credibility of the financial reporting process[13]. In fact, Ashbaugh-Skaife *et al.* (2007) find that the firms with greater concentrated institutional stock ownership are more likely to voluntarily disclose internal control deficiencies under the SOX 302 regulatory period, a result that indicates an impact of large shareholders' monitoring on management's internal control reporting decisions.

Based on the above notion of large shareholder effect, we express the following alternative hypothesis about the relationship between the percentage shareholding by

institutional and non-institutional large investors and a firm's timely action to remediate ICW:

H2a. Ceteris paribus, the higher the stock ownership of institutional and non-institutional large investors, the greater is the likelihood that the firm will remediate its ICW in a timely manner.

Research design

We apply ordinal logistic regression to examine the association between stock ownership characteristics and timeliness of ICW remediation action in the presence of board, audit committee, and other firm characteristics (Goh, 2009; Long, 1997). The dependent variable, REMEDIATE in our logistic regression models is allowed to take on one of three values, FAST, SLOW, or NO, depending upon the speed of remediation. Our primary independent variables include managerial and institutional stock ownership and non-institutional block shareholding. Based on prior studies (Goh, 2009), we include several board and audit committee-related governance and firm-characteristic variables as controls in our analysis. Our independent stock ownership variables consist of managerial stock ownership (PMGR), diffused institutional stock ownership (DIFF_INST), concentrated institutional stock ownership (CONC_INST), non-institutional blockholder ownership (BLOCK_NINST), and stock ownership of dominant shareholders (DOMINANT). These ownership variables are used as a proxy for the effect of monitoring by various ownership groups on a firm's action to remediate ICW in a timely manner. Because DOMINANT is highly correlated with PMGR, CONC_INST and BLOCK_INST, we estimate two different regression models as described below[14]:

$$\begin{aligned} \text{logit } P(\text{REMEDATE}) = & \beta_0 + \beta_1 \text{ BD_INDP} + \beta_2 \text{ BD_SIZE} + \beta_3 \text{ BD_MEET} \\ & + \beta_4 \text{ NONACC_FIN_EX} + \beta_5 \text{ AC_SIZE} \\ & + \beta_6 \text{ AC_MEET} + \beta_7 \text{ AC_FIN_EX} \\ & + \beta_8 \text{ CEO_DUALITY} + \beta_9 \text{ CEO_TEN} + \beta_{10} \text{ PMGR} \\ & + \beta_{11} \text{ DIFF_INST} + \beta_{12} \text{ CONC_INST} \\ & + \beta_{13} \text{ BLOCK_NINST} + \beta_{14} \text{ LTA} + \beta_{15} \text{ GROWTH} \\ & + \beta_{16} \text{ OCF} + \beta_{17} \text{ ZSCORE} + \beta_{18} \text{ RESTRUCT} \\ & + \beta_{19} \text{ SEVERITY} + \beta_{20} \text{ GCO} + \beta_{21} \text{ SEGMENT} \\ & + \beta_{22} \text{ FOREIGN} + \text{Industry Dummy Variables} + \varepsilon \end{aligned} \quad (1)$$

$$\begin{aligned} \text{logit } P(\text{REMEDATE}) = & \beta_0 + \beta_1 \text{ BD_INDP} + \beta_2 \text{ BD_SIZE} + \beta_3 \text{ BD_MEET} \\ & + \beta_4 \text{ NONACC_FIN_EX} + \beta_5 \text{ AC_SIZE} \\ & + \beta_6 \text{ AC_MEET} + \beta_7 \text{ AC_FIN_EX} \\ & + \beta_8 \text{ CEO_DUALITY} + \beta_9 \text{ CEO_TEN} \\ & + \beta_{10} \text{ PMGR} + \beta_{11} \text{ DIFF_INST} + \beta_{12} \text{ DOMINANT} \\ & + \beta_{13} \text{ LTA} + \beta_{14} \text{ GROWTH} + \beta_{15} \text{ OCF} \\ & + \beta_{16} \text{ ZSCORE} + \beta_{17} \text{ RESTRUCT} \\ & + \beta_{18} \text{ SEVERITY} + \beta_{19} \text{ GCO} + \beta_{20} \text{ SEGMENT} \\ & + \beta_{21} \text{ FOREIGN} + \text{Industry Dummy Variables} + \varepsilon \end{aligned} \quad (2)$$

Dependent variable

REMEDiate is equal to 2 (FAST remediators) if the firm remedies ICW in the year immediately following the ICW disclosure year (i.e. the immediately next year's SOX 404 opinion is unqualified); REMEDiate is equal to 1 (SLOW remediators), if the firm remedies ICW in the second fiscal year after the disclosure of ICW (i.e. the immediately next year's SOX 404 opinion is adverse but the following year's SOX 404 opinion is unqualified); REMEDiate is equal to 0 (NO remediators), if the firm fails to remediate ICW within the two fiscal years after the year of the first ICW disclosures pursuant to SOX 404 thus having a qualified SOX 404 opinion at the end of the two-year time horizon after the first-time ICW reporting.

Independent variables

PMGR – percentage of outstanding common shares held by managerial personnel (i.e. insider percentage stock ownership); DIFF_INST – diffused institutional common stock ownership measured as percentage of common shareholdings by institutional investors who individually own less than 5 percent outstanding common stock; CONC_INST – concentrated institutional common stock ownership measured as percentage of common shareholdings by institutional investors who individually own 5 percent or more outstanding common stock; BLOCK_NINST – percentage of common stock held by non-institutional investors who individually own 5 percent or more outstanding common shares; DOMINANT – percentage of common stock ownership by a dominant shareholder or a group of related shareholders owning 20 percent or more outstanding common shares[15].

Control variables

BD_INDP – percentage of outside board members independent of company management; BD_SIZE – number of non-audit committee board members; BD_MEET – number of times the board meets in a fiscal year; NONACC_FIN_EX – proportion of audit committee members with non-accounting financial expertise; AC_SIZE – number of audit committee members; AC_MEET – number of times the audit committee meets in a fiscal year; AC_FIN_EX – proportion of audit committee members with accounting financial expertise; CEO_DUALITY – a dummy variable of 1 if the CEO and chairman are different individuals, 0 otherwise (a measure of board independence of its CEO); CEO_TEN – number of years of continuous service by the current CEO; LTA – natural log of total assets; GROWTH – percentage growth in sales over the last three years; OCF – operating cash flows scaled by average total assets; ZSCORE – Altman's (1993) Z-score for financial distress, which is calculated as: $0.717 * (\text{net working capital} / \text{total assets}) + 0.847 * (\text{retained earnings} / \text{total assets}) + 3.107 * (\text{earnings before interest and tax} / \text{total assets}) + 0.42 * (\text{book value of equity} / \text{total liabilities}) + 0.998 * (\text{sales} / \text{total assets})$; RESTRUCT – a dummy variable of 1 for firms engaged in reconstruction activity; 0 otherwise – a measure of organizational change; SEVERITY – number of ICW reported; GCO – a dummy variable of 1 if a firm receives a going-concern audit opinion in the current or previous fiscal year and 0 otherwise; SEGMENT – number of reported business segments – a proxy for operating complexity; FOREIGN – a dummy variable of 1 if a firm reports foreign currency adjustments, 0 otherwise. Industry dummy variables control for the industry-specific fixed effects on the ICW remediation process[16].

We estimate the regression models (1) and (2) for both the full sample and the sub-samples which are composed of either company-level or account-specific ICW. Next, we repeat the analysis using the models (1) and (2) with alternative measures of the timeliness of ICW remediation, i.e. FAST versus SLOW, FAST versus NO and SLOW versus NO. Finally, in sensitivity tests, we analyze the effect of changes in governance variables on the timeliness of the ICW remediation action.

Krishnan (2005) observes that firms might have weak governance at the time of detection of ICW. Hence, measuring governance variables including stock ownership constructs at the end of the remediation process better captures the effect of governance strength that impacts the remediation of control weaknesses and allows for any change in those variables upon ICW detection and reporting (Goh, 2009). In our study, this means that when ICW are formally identified and reported by external auditors, managers are likely to become more active to take remedial action on a timely basis, and large and institutional stockholders are likely to put pressure on management to resolve the control problems promptly in order to improve reporting quality. Therefore, for the FAST and SLOW remediation firms, governance variables including stock ownership constructs are measured at the end of the fiscal year when the firms first receive the unqualified SOX 404 report from their auditors. For the NO remediation firms, governance variables including stock ownership constructs are measured at the end of the two fiscal periods after the year of the first ICW reporting, when the qualified SOX 404 reports are still issued to those firms[17]. The firm-characteristic variables are also measured at the same time that the governance variables are measured.

The board and audit committee-related governance variables that are included in the model are based on Goh's (2009) proposition that these variables proxy for the strength of board and audit committee-related governance activities on a firm's timely remediation decision. Goh (2009) finds that some of the variables such as NONACC_FIN_EX, AC_SIZE, and BD_INDP are significantly positively associated with timeliness in remediation of ICW. We further include two CEO characteristic variables, such as CEO_DUALITY and CEO_TEN, as controls in the analysis with the expectation that a board independent of its CEO and a CEO with long tenure would be more effective in taking prompt remediation action to correct internal control problems.

We further include several firm-specific factors as control variables in the model. These variables proxy for the effect of information environment, visibility, risk, growth, complexity, profitability, financial distress and the severity of control weaknesses on timeliness in a firm's action to remediate ICW after their disclosures. We expect that firm characteristics may play significant roles in the timeliness of remediation action. Financially troubled firms with cash flow problems may have difficulty in remedying ICW. Firms that are larger, more complex and growing rapidly and undergoing organizational changes (through restructuring programs) are more likely to attract the attention of the investing community and thus are more inclined to remediate their control problems. However, those firms may need more time to remediate their ICW because material weaknesses affect more operating areas and segments for large and complex firms. Firms that grow fast need to match internal controls with the growth and thus need more time, while firms with organizational changes (through restructuring programs) have greater incentives to fix control problems because of their desire to emerge stronger after the organizational changes. However, such change may necessitate spending more time to move resources to other areas, thus delaying the remediation action (Goh, 2009).

This discussion also underscores the importance of the cash flow situation of an ICW firm. The larger the cash flow position of a firm, the greater is the possibility of its immediate remediation of control problems. Moreover, firms with relatively severe control problems as indicated by the number of reported control weaknesses are less likely to remediate them immediately. It takes time and resources to remediate control weaknesses in different areas of operations. Finally, firms that received going-concern audit opinions are viewed by their auditors as having uncertainty about their continued existence in the future because of adverse financial conditions. Those firms are less likely to resolve their control weaknesses in a timely manner[18].

Based on the above discussion, we expect that REMEDIATE is positively associated with OCF and ZSCORE and is negatively associated with GROWTH, SEVERITY, GCO, SEGMENT, RESTRUCT, and FOREIGN; however, we are not sure about the direction of the association between REMEDIATE and LTA, a size proxy, because though larger firms may become more inclined to remediate their control problems immediately due to their increased visibility, the greater resource needs and complexity associated with the mobilization of resources across various operating areas may delay the remediation action.

Sample selection

We initially select 1,404 ICW firms per auditors' attestation reports under SOX 404 for the fiscal year-end between November 15, 2004 and December 31, 2006 from Audit Analytics. We consult the Audit Analytics database and also read auditors' reports included in the form 10K submitted to the Securities and Exchange Commission (SEC) in order to choose the ICW firms[19]. Consistent with prior studies, we allow sufficiently long period of time (i.e. two years from the year of first ICW reporting) to observe the firms' remediation effort. So, our time horizon to observe remediation efforts is 2005 and 2006 for 2004 first-time ICW reporting, 2006 and 2007 for 2005 first-time ICW reporting, and 2007 and 2008 for 2006 first-time ICW reporting. For each ICW reporting year, the next two years is the time horizon. If ICW are not remedied within the two-year time frame, the firms are classified as NO remediators. From the initial sample, we arrive at the final sample of 695 ICW firms by applying several filters that lead us to eliminate the firms as follows: 24 firms for non-availability of second SOX 404 reports, 28 firms not audited by one of the dominant audit suppliers (i.e. Big 4 plus Grant Thornton and BDO Seidman)[20], 35 foreign issuers, 18 subsidiaries of other ICW firms, 298 firms with non-availability of governance data from proxy statements and the Compact Disclosure and Corporate Library databases, and 116 firms for not having firm-specific data from the Compustat database. Finally, we exclude 190 firms that previously reported their ICW in the SOX 302 regulatory regime[21]. Of the 695 ICW firms, 379 firms are FAST remediators, 214 firms are SLOW remediators, and 102 firms are NO remediators[22].

For the sample firms, many ICW relate to specific accounting/transaction procedures (can be identified by auditors through substantive testing), while others relate to the overall financial reporting process and control environment having company-wide adverse effect (difficult for auditors to effectively audit around). Some ICW firms have control weaknesses in multiple areas that are all-pervasive in nature at the company-level (e.g. staffing issues like segregation of duties, quality and training of accounting personnel, internal audit and/or audit committee quality, information system problems and reconciliation of accounts and financial statement preparation as identified

in Raghunandan and Rama, 2006), while others have transactions or account-specific control weaknesses that are more localized in nature. Some firms have both company-level and account-specific ICW, while others have either company-level or account-specific ICW. Furthermore, some firms have multiple transaction/account-specific ICW.

Following Raghunandan and Rama (2006) and Doyle *et al.* (2007b, a), we classify the firms having company-level ICW when they have either company-level control weaknesses or both company-level and account-specific control weaknesses (i.e. company-level). Further, if a firm has at least three account-specific ICW but no company-level ICW, we classify the firm as having company-level ICW. The remainder of the ICW firm observations is classified as having account-specific ICW (i.e. account-specific). We explain the selection criteria for the company-level and account-specific ICW in the Appendix to the paper. Of 695 firms, 288 firms are associated with company-level ICW, whereas 407 firms are associated with accounts-specific ICW. We present the sample selection process and the timeline of the respective remediation actions for the sample ICW firms in Table I[23].

Descriptive data and correlations

Table II reports the descriptive data and univariate test statistics for the variables used in the analysis. We provide information separately for the full sample and for the sub-samples of NO, SLOW, and FAST remediation firms. The last three columns present the *t*-statistics for the mean difference between the observations relating to the alternative ICW remediation times. Some statistics are noteworthy. The ownership-characteristic variables, PMGR, DIFF_INST, CONC_INST, BLOCK_NINST, and DOMINANT, are significantly greater in the FAST remediation firms than both in the SLOW and NO remediation firms. These ownership variables are also significantly greater in the SLOW remediation firms than in NO remediation firms. Other control governance variables, such as BD_INDP, BD_SIZE, NONACC_FIN_EX, and CEO_DUALITY, have similar comparative test statistics among the sub-samples of the remediation firms. The FAST remediators have significantly greater governance strength than both the SLOW and NO remediators. Further, several firm-specific characteristics, such as OCF, ZSCORE, and SEGMENT, are significantly greater in the FAST remediation firms compared to the SLOW and NO remediation firms. Finally, we observe that SLOW and NO remediation firms have significantly higher mean values for SEVERITY than FAST remediation firms.

Table III presents the Pearson's correlation statistics between the five independent variables of interest. PMGR is marginally positively correlated with CONC_INST at the 10 percent level and is significantly positively correlated with DOMINANT at the 1 percent level; DIFF_INST is significantly positively correlated with BLOCK_NINST at the 10 percent level; CONC_INST is not correlated with BLOCK_NINST. DOMINANT is highly correlated with all other ownership variables except DIFF_INST. As a result, we use the ownership construct, DOMINANT in place of PMGR, CONC_INST, and BLOCK_NINST in the second regression model.

Results

Main analyses

Table IV presents the results of the ordered logistic regression analyses for the full sample using the regression models (1) and (2). The model 1 is significant as indicated by its χ^2 value. The pseudo R^2 of 53 percent indicates a high goodness of fit. Wald χ^2

Variables	Full sample (n = 695)		NO remediation (n = 102)		SLOW remediation (n = 214)		FAST remediation (n = 379)		t-statistics for mean difference		t-statistics for mean difference	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median	FAST-NO	SLOW-NO	FAST-SLOW	
BD_INDP	0.76	0.79	0.60	0.64	0.71	0.74	0.84	0.89	14.319***	6.145***	16.218***	
BD_SIZE	8.92	8.00	6.84	7.00	8.03	7.00	10.00	9.00	5.831***	3.813***	2.581***	
BD_MEET	12.59	11.00	12.10	9.00	11.59	11.00	13.30	12.00	1.394	-0.896	1.217	
NONACC_FIN_EX	0.55	0.60	0.52	0.59	0.53	0.56	0.60	0.61	2.016**	0.832	2.132**	
AC_SIZE	3.53	3.42	3.46	3.06	3.48	3.38	3.58	4.01	1.131	0.716	0.532	
AC_FIN_EX	0.41	0.40	0.40	0.41	0.42	0.44	0.39	0.39	1.010	-0.090	0.860	
AC_MEET	4.77	4.00	4.49	3.00	4.68	5.00	4.89	5.00	1.386	0.861	0.918	
CEO_DUALITY	0.54	1.00	0.31	0.00	0.49	0.00	0.63	1.00	5.284***	2.021**	2.243**	
CEO_TEN	2.18	2.32	2.02	2.11	2.19	2.18	2.21	2.44	0.701	0.114	0.086	
PMGR	0.09	0.07	0.06	0.05	0.09	0.06	0.11	0.08	5.802***	3.333***	4.217***	
DIFF_INST	0.32	0.28	0.19	0.24	0.28	0.32	0.38	0.35	6.023***	2.214**	3.517***	
CONC_INST	0.26	0.29	0.17	0.26	0.21	0.24	0.31	0.34	2.631***	1.786**	3.183**	
BLOCK_NINST	0.24	0.25	0.18	0.11	0.22	0.18	0.27	0.30	2.984***	2.132**	2.217**	
DOMINANT	0.43	0.46	0.27	0.29	0.36	0.41	0.48	0.47	4.830***	2.981***	3.218***	
LTA	6.21	5.53	6.14	5.19	6.19	5.82	6.24	5.78	0.361	0.214	0.284	
GROWTH	0.24	0.26	0.21	0.26	0.25	0.31	0.24	0.28	0.586	0.632	-0.214	
OCF	0.07	0.08	0.03	0.04	0.06	0.05	0.09	0.07	4.812***	2.282**	2.374**	
ZSCORE	8.71	7.22	5.37	5.81	7.48	7.01	10.30	8.69	5.324***	2.228**	3.851***	
RESTRUCT	0.47	1.00	0.48	1.00	0.49	1.00	0.46	1.00	-1.839	0.917	-1.317	
SEVERITY	2.24	2.15	2.81	2.56	2.45	2.20	1.97	2.04	-2.961***	-2.093**	-2.233**	
GCO	0.08	0.00	0.06	0.00	0.08	0.00	0.09	0.00	1.681*	0.323	1.214	

(continued)

Table II. Descriptive data and univariate statistics

Table II.

Variables	Full sample (<i>n</i> = 695)		NO remediation (<i>n</i> = 102)		SLOW remediation (<i>n</i> = 214)		FAST remediation (<i>n</i> = 379)		<i>t</i> -statistics for mean difference		<i>t</i> -statistics for mean difference	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median	FAST:NO	SLOW:NO	FAST:SLOW	FAST:SLOW
SEGMENT	2.79	3.08	1.65	2.09	2.39	2.95	3.32	3.86	4.553***	2.119**	3.024**	3.024**
FOREIGN	0.36	0.00	0.35	0.00	0.34	0.00	0.37	0.00	0.379	0.211	0.514	0.514

Notes: Variable definitions: PMGR – percentage of outstanding common shares held by managerial personnel (i.e. insider percentage stock ownership); DIFF_INST – diffused institutional common stock ownership measured as percentage of common shareholdings by institutional investors who individually own less than 5 percent outstanding common stock; CONC_INST – concentrated institutional common stock ownership measured as percentage of common shareholdings by institutional investors who individually own 5 percent or more outstanding common stock; BLOCK_NINST – percentage of common stock held by non-institutional investors who individually own 5 percent or more outstanding common shares; DOMINANT – percentage of common stock ownership by a dominant shareholder or a group of related shareholders owning more than 20 percent of the outstanding common shares; BD_INDP – percentage of outside board members independent of company management; BD_SIZE – number of non-audit committee board members; BD_MEET – number of times the board meets in a fiscal year; NONACC_FIN_EX – proportion of audit committee members with non-accounting financial expertise; AC_SIZE – number of audit committee members; AC_MEET – number of times the audit committee meets in a fiscal year; AC_FIN_EX – proportion of audit committee members with accounting financial expertise; CEO_DUALITY – a dummy variable of 1 if the CEO and chairman are different individuals, 0 otherwise (a measure of board independence of its CEO); CEO_TEN – number of years of continuous service by the current CEO; LTA – natural log of total assets; GROWTH – percentage growth in sales over the last three years; OCF – operating cash flows scaled by average total assets; ZSCORE – Altman's (1993) Z-score for financial distress, which is calculated as: $0.717 * (\text{net working capital} / \text{total assets}) + 0.847 * (\text{retained earnings} / \text{total assets}) + 3.107 * (\text{earnings before interest and tax} / \text{total assets}) + 0.42 * (\text{book value of equity} / \text{total liabilities}) + 0.998 * (\text{sales} / \text{total assets})$; RESTRUCT – a dummy variable of 1 for firms engaged in reconstruction activity and 0 otherwise (a measure of organizational change); SEVERITY – number of ICW reported; GCO – a dummy variable of 1 if a firm receives a going-concern audit opinion in the current or previous fiscal year and 0 otherwise; SEGMENT – number of reported business segments used as a proxy for operating complexity; FOREIGN – a dummy variable of 1 if a firm reports foreign currency adjustments, 0 otherwise

statistics are used to test the significance of the coefficient estimates. The ownership-characteristic variables, PMGR, CONC_INST, and BLOCK_NINST, are all significantly positive at the 1, 5, and 5 percent levels, respectively. DIFF_INST is, however, insignificant. The results support the predictions of the *H1* and *H2*. The ICW firms with higher managerial stock ownership are more likely to remediate control weaknesses in a timely manner. Similarly, the higher the percentage stock ownership held by large and concentrated institutional and non-institutional investors, the greater is the likelihood that the firms will promptly remediate their ICW. Among the control board and audit committee governance variables, BD_INDP, BD_SIZE, and NONACC_FIN_EX, are significantly positively associated with a firm's timely ICW remediation action at different levels of significance. However, BD_MEET, AC_SIZE, AC_MEET, and AC_FIN_EX are all insignificantly positive. Out of the two CEO characteristic variables, CEO_DUALITY is significant at the 5 percent level, indicating that corporate boards independent of their CEO are more effective in monitoring management's action to remediate ICW in a timely manner. CEO_TEN is insignificant. Of the firm-characteristic variables, ZSCORE is significantly positive, indicating that the ICW firms with lower financial distress are more likely to take prompt remediation action, whereas SEVERITY is significantly negative, implying that the greater the number of ICW the lower is the likelihood that the firm will remediate ICW in a timely manner.

Model 2 is also significant at the 1 percent level. The pseudo R^2 of 43 percent indicates a high goodness of fit. The ownership-characteristic variable, DOMINANT, is significantly positive at the 1 percent level. DIFF_INST is also marginally significant at the 10 percent level. The result supports the prediction of the *H2*. For the other governance variables, the results are almost similar to the model 1 analysis except that AC_FIN_EX is significantly positive at the 5 percent level. Of the firm-specific characteristic variables, ZSCORE and LTA are significantly positive at the 5 and 10 percent levels, respectively, while SEVERITY is significantly negative at the 1 percent level.

Additional analysis

Alternative measures of a firm's timely remediation of ICW. Panels A and B of Table V report the binary logistic regression results with alternative measures of a firm's timeliness in the remediation of ICW. Using the regression models 1 and 2, we conduct three binary logistic regression analyses for FAST versus NO remediation, SLOW versus NO remediation, and FAST versus SLOW remediation[24]. In all three analyses, the models are significant as shown by their χ^2 statistics. The reported pseudo R^2 also

Variables	PMGR	DIFF_INST	CONC_INST	BLOCK_NINST	DOMINANT
PMGR	1.000				
DIFF_INST	-0.021	1.000			
CONC_INST	0.067*	-0.039	1.000		
BLOCK_NINST	-0.045	0.070*	0.033	1.000	
DOMINANT	0.411***	-0.015	0.179**	0.281***	1.000

Notes: Significant at: *10, **5 and ***1 percent levels, respectively, based on two-tailed tests; $n = 695$

Table III.
Pearson correlations
between independent
variables of interest

Variables	Model 1 Coefficient	Wald χ^2	Model 2 Coefficient	Wald χ^2
BD_INDP	0.13***	28.33	0.16***	41.83
BD_SIZE	0.21**	4.29	0.23**	4.82
BD_MEET	-0.07	1.58	0.29	0.96
NONACC_FIN_EX	0.63**	5.11	0.64***	13.86
AC_SIZE	0.18	0.53	-0.29	1.89
AC_FIN_EX	0.33	1.02	0.38**	4.01
AC_MEET	0.03	0.68	-0.13	1.52
CEO_DUALITY	4.01**	4.93	3.02***	7.52
CEO_TEN	-0.04	0.66	0.22	0.91
PMGR	2.31***	8.39		
DIFF_INST	0.73	1.98	0.35*	3.01
CONC_INST	1.06**	5.59		
BLOCK_NINST	0.54**	4.26		
DOMINANT			2.29***	18.51
LTA	0.06	0.57	0.23*	3.11
GROWTH	0.11	0.83	-0.51	1.08
OCF	0.83	1.23	0.45	0.69
ZSCORE	0.93*	3.12	1.09**	4.71
RESTRUCT	-0.06	0.13	0.09	1.18
SEVERITY	-1.99**	4.94	-2.42***	9.63
GCO	-0.33	1.33	-0.19	1.36
SEGMENT	-0.06	1.51	0.06	0.17
FOREIGN	-0.06	0.98	-0.11	1.19
Pseudo R^2 (%)	53		43	
χ^2	131.16***		111.41***	

Notes: Significant at: *10, **5, and ***1 percent levels, respectively, based on two-tailed tests; $n = 695$; industry dummy variables are included in the analysis but not reported for the sake of brevity; the variables are defined in Table II

Model1: logit P(REMEDIATE)

$$= \beta_0 + \beta_1 \text{BD_INDP} + \beta_2 \text{BD_SIZE} + \beta_3 \text{BD_MEET} + \beta_4 \text{NONACC_FIN_EX} \\ + \beta_5 \text{AC_SIZE} + \beta_6 \text{AC_MEET} + \beta_7 \text{AC_FIN_EX} + \beta_8 \text{CEO_DUALITY} \\ + \beta_9 \text{CEO_TEN} + \beta_{10} \text{PMGR} + \beta_{11} \text{DIFF_INST} + \beta_{12} \text{CONC_INST} \\ + \beta_{13} \text{BLOCK_NINST} + \beta_{14} \text{LTA} + \beta_{15} \text{GROWTH} + \beta_{16} \text{OCF} + \beta_{17} \text{ZSCORE} \\ + \beta_{18} \text{RESTRUCT} + \beta_{19} \text{SEVERITY} + \beta_{20} \text{GCO} + \beta_{21} \text{SEGMENT} \\ + \beta_{22} \text{FOREIGN} + \text{Industry Dummy Variables} + \varepsilon$$

Model2: logit P(REMEDIATE)

$$= \beta_0 + \beta_1 \text{BD_INDP} + \beta_2 \text{BD_SIZE} + \beta_3 \text{BD_MEET} + \beta_4 \text{NONACC_FIN_EX} \\ + \beta_5 \text{AC_SIZE} + \beta_6 \text{AC_MEET} + \beta_7 \text{AC_FIN_EX} + \beta_8 \text{CEO_DUALITY} \\ + \beta_9 \text{CEO_TEN} + \beta_{10} \text{DIFF_INST} + \beta_{11} \text{DOMINANT} + \beta_{12} \text{LTA} + \beta_{13} \text{GROWTH} \\ + \beta_{14} \text{OCF} + \beta_{15} \text{ZSCORE} + \beta_{16} \text{RESTRUCT} + \beta_{17} \text{SEVERITY} + \beta_{18} \text{GCO} \\ + \beta_{19} \text{SEGMENT} + \beta_{20} \text{FOREIGN} + \text{Industry Dummy Variables} + \varepsilon$$

Table IV.

Ordered logistic regression for ownership characteristics and the timeliness in remediation of ICW

Variables	FAST vs NO remediation		SLOW vs NO remediation		FAST vs SLOW remediation	
	Coefficient	Wald χ^2	Coefficient	Wald χ^2	Coefficient	Wald χ^2
<i>Panel A</i>						
BD_INDP	0.23***	26.13	0.17**	4.69	0.14***	11.25
BD_SIZE	0.38***	7.98	0.13*	3.21	0.19***	9.86
BD_MEET	-0.19	1.29	0.11	0.86	-0.31	1.56
NONACC_FIN_EX	1.22**	4.01	0.49**	4.83	0.53**	5.07
AC_SIZE	-0.11	0.02	0.26	0.16	-0.14	0.15
AC_FIN_EX	0.29*	3.16	0.28	1.98	-0.31	0.86
AC_MEET	0.03	1.01	0.05	0.31	0.03	1.48
CEO_DUALITY	2.39**	5.16	3.01**	6.21	4.53**	5.01
CEO_TEN	0.04	0.98	0.03	0.91	0.01	0.83
PMGR	1.69***	10.39	3.14***	7.13	3.83***	7.81
DIFF_INST	0.41	1.23	0.76	0.96	0.43	1.01
CONC_INST	0.87**	5.32	0.93**	5.53	2.13***	7.91
BLOCK_NINST	0.69**	4.93	0.31**	6.01	0.28	0.52
LTA	0.31	0.63	0.19	0.16	0.36	0.73
GROWTH	0.02	0.13	-0.03	0.03	-0.11	0.02
OCF	0.88**	1.83	0.39*	2.93	1.98**	4.82
ZSCORE	0.88**	4.73	1.63**	4.98	1.89**	5.60
RESTRUCT	-0.08	1.08	-0.01	0.11	-0.04	0.11
SEVERITY	-3.93***	10.16	-0.77**	6.29	-1.89***	7.29
GCO	-0.33	0.87	-0.43	0.98	-0.51	0.98
SEGMENT	-0.09*	3.13	-0.18*	2.88	0.07	1.88
FOREIGN	0.20	1.41	-0.31	0.09	-0.09	0.09
Pseudo R^2 (%)	48		39		61	
χ^2	129.18***		93.33***		99.01***	
<i>Panel B</i>						
BD_INDP	0.93***	39.98	0.40***	9.89	0.23***	21.19
BD_SIZE	0.32***	11.01	0.19*	3.48	0.33**	4.29
BD_MEET	0.03*	2.92	-0.16	0.91	-0.77	1.53
NONACC_FIN_EX	0.83***	8.96	0.40*	3.39	0.59**	4.63
AC_SIZE	-0.24	0.33	0.10	1.18	-0.10	0.29
AC_FIN_EX	0.66**	4.79	0.31*	3.53	0.51**	5.12
AC_MEET	-0.33	0.49	-0.08*	2.71	-0.17	1.56
CEO_DUALITY	5.31***	11.21	3.63***	9.56	3.69*	3.01
CEO_TEN	-0.16*	3.26	0.06	1.18	0.43	1.71
DIFF_INST	0.73**	4.09	0.73*	2.93	0.58*	3.16
DOMINANT	2.18***	11.03	1.36**	4.89	0.91***	8.06
LTA	0.72**	4.09	0.22	0.89	0.19	0.43
GROWTH	-0.28*	3.21	0.19	1.33	-0.41	2.11
OCF	1.38	11.19***	0.62	2.31	1.29***	6.11
ZSCORE	0.86**	4.19	0.24	1.98	1.07**	3.96
RESTRUCT	-0.11	2.09	0.06	0.38	-0.14	0.39
SEVERITY	-3.96***	11.51	-1.29***	11.56	-0.39*	2.83
GCO	-0.22	0.93	-0.56	1.81	-0.24	1.01
SEGMENT	-0.16*	3.11	-0.29	1.56	-0.11	1.16
FOREIGN	0.18	1.01	-0.33	1.03	-0.19*	3.29
Pseudo R^2 (%)	52		38		46	
χ^2	124.39***		82.16***		109.33***	

Notes: Significant at: *10, **5, and ***1 percent levels, respectively, based on two-tailed tests; industry dummy variables are included in the analysis but not reported for the sake of brevity; the variables are defined in Table II

Table V. Binary logistic regression for alternative measures of timeliness in remediation of ICW

indicate high goodness of fit for the models. Panel A reports the results for the model 1 analysis. Similar to the main analyses, we find that PMGR, CONC_INST, and BLOCK_NINST are all positive and significant at various levels in the presence of other board and audit committee governance variables except in the FAST versus SLOW analysis where BLOCK_NINST is insignificant. DIFF_INST is insignificant in all three regressions. Furthermore, several board and audit committee governance and firm-characteristic variables are significant at various levels.

Panel B reports three regression results using the model 2. The results are almost similar to the main tests that DOMINANT is highly positively significant in all three regressions. Moreover, DIFF_INST appears to be significantly positive at the 5 percent level in the FAST versus NO analysis and at the 10 percent level in the other two analyses. Although diffused institutional shareholders are not likely to get seriously involved in monitoring management actions, the magnitude of collective action of such diffused owners, sometimes, may have some influence on corporate decisions. However, the results (some of which are marginally significant) supporting this view for diffused institutional stockholders are obtained only in the model 2 analysis making it difficult to arrive at any conclusive evidence. The results for the board and audit committee governance and other firm-characteristic variables are mostly consistent with the previous results. Overall, the analyses using the alternative measures of timely ICW remediation produce results for the ownership variables similar to the main tests.

Remediation of company-level and account-specific ICW. Table VI reports the ordered logistic regression results for the sub-sample analysis for the firms with the company-level and the account-specific ICW. The model 1 analysis show that the ownership variables, PMGR, CONC_INST, and BLOCK_NINST, are all significantly positively associated with the timeliness in the remediation of both types of ICW. But the coefficients are relatively more robust for the remediation of the account-specific ICW than for the company-level ICW. Furthermore, DIFF_INST is positive and moderately significant for the remediation of the account-specific ICW but not for the company-level ICW. Among the other governance variables, BD_INDP, BD_SIZE, CEO_DUALITY, and NONACC_FIN_EX are all significantly positively associated with the timely remediation of both the company-level and account-specific ICW. Among other firm-characteristic variables, ZSCORE, OCF, and GCO, are all significantly associated with the timely remediation of the account-specific ICW but are not significant for the company-level ICW. Finally, SEVERITY is negatively significant for both sub-samples.

The model 2 analyses show that DOMINANT is significantly positively associated with the timely remediation of both types of ICW but its coefficient is more robust for the account-specific ICW. Again, DIFF_INST is positive and moderately significant only for the remediation of the account-specific ICW. Similar to the model 1 analysis, a number of board and audit committee-related governance variables, such as BD_INDP, BD_SIZE, CEO_DUALITY, and NONACC_FIN_EX, are significantly positive in both sub-sample analyses. ACC_FIN_EX is significantly positive in the analysis using the company-level ICW sample, whereas AC_SIZE and AC_MEET are significantly positive in the analysis using the account-specific ICW sample. Of the firm-characteristic variables, SEVERITY and SEGMENT are significantly negative,

	Company-level ICW ($n = 288$)				Account-specific ICW ($n = 407$)			
	Model 1		Model 2		Model 1		Model 2	
	Coefficient	Wald χ^2	Coefficient	Wald χ^2	Coefficient	Wald χ^2	Coefficient	Wald χ^2
BD_INDP	0.18***	21.22	0.19***	71.12	0.11***	48.29	1.49***	69.93
BD_SIZE	0.19*	3.07	0.11*	3.11	0.23**	5.22	0.18*	3.53
BD_MEET	0.01	1.83	-0.07	1.73	-0.14	1.33	0.06	2.18
NONACC_								
FIN_EX	0.39*	2.98	0.39**	5.10	0.72**	5.01	0.79***	17.22
AC_SIZE	0.00	0.61	-0.16	0.91	-0.21	1.55	0.23**	3.82
AC_FIN_EX	0.41	1.58	0.33	3.45*	0.09	0.78	0.08	1.29
AC_MEET	-0.23	2.07	0.18	2.09	0.11	1.29	1.13**	6.86
CEO_								
DUALITY	2.01*	2.86	3.44*	3.21	4.11***	8.43	5.29***	9.83
CEO_TEN	0.04	1.11	-0.17	1.87	-0.09	1.81	1.19	0.93
PMGR	2.18**	4.82			3.02***	18.53		
DIFF_INST	0.21	0.83	0.15	0.98	0.68*	3.17	0.69*	2.92
CONC_INST	0.50**	5.33			1.50**	5.48		
BLOCK_								
NINST	0.39*	3.17			0.88**	5.09		
DOMINANT			0.71***	8.21			1.08***	8.39
LTA	0.09	0.91	0.44	2.21	0.08	1.63	0.93*	2.96*
GROWTH	-0.06	0.42	-0.19	1.82	0.13	0.83	0.07	1.51
OCF	0.70	2.01	0.19	0.56	0.18*	2.93	-0.16	0.83
ZSCORE	0.53	2.40	1.19**	4.29	1.57*	3.59	2.38**	5.13
RESTRUCT	-0.13	0.83	-0.03	1.82	0.16	0.59	0.11	1.48
SEVERITY	-1.23***	11.48	-0.91*	2.89	-2.19**	3.96	-2.53**	5.096
GCO	-0.11	1.41	-0.23	1.33	-0.82*	2.87	-1.18**	5.13
SEGMENT	0.02	1.39	-0.23*	3.68	-0.13	2.43	-0.93**	4.83
FOREIGN	0.09	0.73	0.02	1.81	-0.23	1.48	0.16	1.88
Pseudo R^2 (%)	37		31		53		52	
χ^2	108.31***		93.513***		224.01***		217.59***	

Notes: Significant at: *10, **5, and ***1 percent levels, respectively, based on two-tailed tests; industry dummy variables are included in the analysis but not reported for the sake of brevity; the variables are defined in Table II

Table VI.
Ordered logistic regressions for ownership characteristics and timeliness in remediation of company-level and account-specific ICW

while ZSCORE is significantly positive in both the sub-sample analyses. In the account-specific sub-sample analysis, LTA and GCO are also significant.

Changed data for the variables. In the main analyses, we measure governance variables (including stock ownership constructs) at the end of the remediation process because these measures are expected to better capture the effect of governance strength that impacts the remediation of ICW and allows for any change in those variables upon detection and reporting of ICW (Goh, 2009). In the supplemental tests, we apply the changed data for the variables in our analysis. We consider the changes in ownership characteristics, board and audit committee variables, and firm-characteristic variables from the year the ICW are first reported to the year the firm receives an unqualified SOX 404 opinion. For example, for the first-time ICW reporting firms in 2004 that receive unqualified SOX 404 opinions at the fiscal year-end in 2005 (i.e. FAST remediators), the change in variables are calculated over the one-year time period from

the end of 2004 to the end of 2005. For the 2004 ICW reporting firms who receive unqualified SOX 404 opinions at the fiscal year-end in 2006 (i.e. SLOW remediators), the change is calculated over the two-year time period from 2004 to 2006. Several governance variables including stock ownership structures have changed over time. The results (not tabulated here), of the models 1 and 2 analyses show that none of those changed ownership-characteristic variables are significant, but some board related governance variables, such as BD_INDP and BD_SIZE, appear to be significantly positive. We also observe that CEO_DUALITY is significantly positive in the model 1 analyses but is insignificant in the model 2 analyses. None of the audit committee-related variables are significant. Furthermore, a few firm-specific characteristic variables, such as ZSCORE, OCF, and LTA, are significant at various levels. Therefore, though the changes in some governance variables in subsequent years are related to the ICW remediation in a timely manner, the changes in our stock ownership variables are not associated with the timely remediation of ICW[25].

Timely remediation of ICW disclosed under SOX 302. We exclude 190 firms that previously disclosed their ICW under SOX 302 from the main analysis as we primarily focus on the timely remediation of ICW reported for the first-time under mandatory SOX 404. As a supplemental test, we evaluate the relationship between the timely remediation of those ICW (reported under both SOX 302 and SOX 404 regulatory regime) and a firm's stock ownership attributes. Out of 190 firms (that reported their control weaknesses both in pre-SOX 404 years and in the year 2004), 118 firms remediate their ICW in 2005 (FAST), 49 firms remediate their ICW in 2006 (SLOW), and the remaining 23 firms do not remediate within the two-year time frame (NO). The models 1 and 2 logistic regression analyses of those 190 ICW firms produce the results (not tabulated here) consistent with the results for the mandatory SOX 404 regime. All ownership-characteristic variables, PMGR, CONC_INST and BLOCK_NINST and DOMINANT are significantly positive at various levels. Furthermore, several board and audit committee-related governance variables, i.e. BD_INDP, BD_SIZE, NONACC_FIN_EX, and AC_FIN_EX and CEO_DUALITY, are also significantly positively associated with the timely ICW remediation action.

Conclusions

Our study examines the association between stock ownership characteristics and the timeliness of remediation of ICW reported for the first time by the SEC registrants pursuant to SOX 404. By considering the role of an important but previously unaddressed aspect of corporate governance, i.e. the association between the corporate ownership characteristics and the timely remediation of ICW over a financial reporting under Section 404 of the Sarbanes-Oxley Act (SOX) of 2002, the study complements several recent studies that investigate the association between board and audit committee characteristics and the timely remediation of ICW. The results of our first model analyses suggest that the firms having higher managerial stock ownership are more inclined to remediate ICW in a timely manner. The analyses further indicate that concentrated institutional stock ownership and non-institutional blockholder ownership are related to the prompt remediation of ICW. The results of our second model analyses show that dominant shareholder ownership is positively related to the timeliness of ICW remediation. Although diffused institutional ownership is included in both models, it is only significant in the second model analyses. These main results

hold in a number of additional tests that include using alternative measures of timeliness of ICW remediation and two different types of ICW, company-level and account specific. Our stock ownership variables are significant even in the presence of other board and audit committee and firm-characteristic variables. These results are consistent with the findings in other accounting and finance studies that stock ownership characteristics occupy an important position in the overall governance mechanism of a firm and influence management decisions in crucial corporate matters.

In the post-SOX period, US corporations are subject to enhanced regulatory oversight and scrutiny. This study shows that corporate ownership attributes are still relevant in understanding the reaction of management to a situation that calls for prompt managerial action to restore the credibility of reported financial information. Furthermore, for the first time, the study makes a separate detailed analysis on the association between the stock ownership characteristics and the timely remediation of company-level and account-specific ICW. The results provide valuable insights into the ownership-related governance effect on the timeliness of the remediation of the two types of control weaknesses, company-level and account-specific ICW, that have different rigor, auditability (more or less auditable), and effects (pervasive or non-pervasive) on financial reporting quality. Finally, the study enhances our understanding of certain important governance attributes that help achieve a sound financial reporting system and restore investors' confidence in the system.

The study's results should however be interpreted with some caution. First, this study includes only accelerated filers who have an equity market capitalization of \$75 million or more. In order to establish the external validity of the results, future research should consider an extension of this study to non-accelerated filers. Second, like other association tests, this study demonstrates an association between the stock ownership characteristics and the timely remediation of ICW. Our results do not establish any cause-and-effect relationship. Finally, we broadly partition the sample into two groups based on two types of ICW. This research can further be extended to a detailed analysis of the individual types of company-level and account-specific ICW.

Notes

1. Our study is also relevant in the context of Section 971 of the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010 (US House of Representatives, 2010) which includes a provision that may potentially increase the influence of large shareholders in corporate decisions. This law allows the SEC to issue a ruling that requires the proxy statement to include not only information about the nominees from a shareholder or group of shareholders but also the ability for individual shareholders to vote for these nominees.
2. Shleifer and Vishny (1997) suggest that ownership concentration is an important determinant of corporate governance. Jensen and Meckling (1976) further argue that large shareholder activism seems to intensify when ownership becomes concentrated in the hands of such investors. Large owners fully capture the economic benefits from their activism and perceive their oversight activities as cost effective (Financial Economists' Roundtable, 1999). Furthermore, managerial stock ownership is an essential factor to resolve agency conflicts. It has long been recognized that an increase in managerial stock ownership aligns manager-shareholder interests and mitigates agency problems between the two parties (Berle and Means, 1932; Jensen and Meckling, 1976; Demsetz, 1983).
3. Hoitash *et al.* (2008) find that disclosures of both the company-level and account-specific ICW under SOX 404 are associated with higher audit fees, but the company-level control

problems have stronger association with audit fees. This finding is consistent with Moody's Investors Service's (2004) belief that an auditor cannot as easily audit a firm with company-level material weaknesses as it can audit a firm with account-level material weaknesses.

4. Ineffective internal controls create greater risk of financial misreporting. The critical role of internal control in ensuring reliability of accounting information was substantially emphasized when internal control disclosures were mandated for the SEC registrants under SOX 404. The rules require management's assessment of internal control effectiveness and auditors' attestation report on management's assessment of internal controls. Further, the Public Company Accounting Oversight Board's Auditing Standard No. 2 provide the necessary guidelines for external auditors to conduct a separate audit of internal control over financial reporting (ICFR) and to issue a report on the effectiveness of their clients' ICFR. In response to a survey conducted by the Office of Economic Analysis of the SEC in 2009, the participating company executives indicated the following benefits derived from the implementation of SOX 404: (1) quality of internal control structure; (2) audit committee's confidence in the company's ICFR; (3) quality of company's financial reporting; (4) company's ability to prevent and detect fraud; and (5) confidence in the financial reports of other companies complying with SOX 404. Through its added focus on a firm's internal control system, SOX 404 intends to make sure that the public companies take appropriate action promptly to remediate their ICW and to improve the credibility of reported information.
5. In a related study, Mitra and Hossain (2011) find that corporate governance mechanisms in the form of board diligence, CEO-independent board, and managerial, institutional and dominant shareholdings are positively associated with the firms' action to remediate ICW. The current study focuses on the timeliness in ICW remediation action by the first time adopters of SOX 404, which is deemed to be more critical from the standpoint of reporting quality, and investigates the issue by using different research design.
6. Since the owners of most large US corporations are separated from firm management, there is a possible incentive for managers to misreport financial results for opportunistic purposes (Jensen and Meckling, 1976; Watts and Zimmerman, 1986). Managers may engage in non-value-maximizing activities to increase their compensation and other perquisites and/or participate in activities associated with management entrenchment (Shleifer and Vishny, 1989).
7. Gul *et al.* (2003) argue that in a high managerial ownership firm there is a greater probability that accruals are likely to be realized in the future which implies that accrual adjustments are informationally driven rather than opportunistically driven. This behavior is consistent with the notion that managers whose interests are aligned with shareholders are more likely to report income that reflects the underlying economic value of the firm (Warfield *et al.*, 1995). Moreover, McConnell and Servaes (1990) demonstrate that a higher proportion of insider ownership mitigates agency problems and improves firm value.
8. Alternatively, managerial entrenchment theory suggests that large ownership stake makes managerial interest too entrenched in an entity with the objective of attaining private gain dominates in many managerial decision making. However, we argue that the issue of resolving ICW problem in a timely manner, ensuring financial reporting credibility and improving agency relationship are overriding concerns for managers in the mandatory reporting regime under SOX Section 404 especially when they have larger ownership stake in an entity.
9. (1) GM's management made major policy changes less than three weeks after a threat was made by the Council of Institutional Investors, a pension fund organization collectively owning over \$1 trillion of assets and taking active part in the corporate governance

(Hessel and Norman, 1992). The co-chairperson of the council has made it clear that such pressure would continue when he said: "The Council members want to meet with CFOs to make sure that their opinions are considered when policies are formulated and to ensure that management feels accountable to someone outside the firm." Moreover, a study by Opler and Sokobin (1995) on the activism of the Council of Institutional Investors provides evidence that the firms on the council's focus lists subsequently experienced significant improvements in operating profitability and share returns. (2) According to a study commissioned by CalPERS, Steven Nesbitt of Wilshire Associates conducted a before-and-after analysis of 42 firms targeted for reform by CalPERS. After being targeted, the aggregate stock returns of those firms for five years were 52.5 percent higher than the returns on the S&P 500 index. Before being targeted, those firms under-performed the S&P 500 index by 66 percent over a five-year period. Another study by Smith (1996) on CalPERS' activism finds that the combined gain to CalPERS for their activities related to 34 target firms was \$19 million during the 1987-1993 period, while the total cost of monitoring was \$3.5 million. So, their activism worked. (3) Kane and Velury (2004) suggest that institutional investors influence management in two ways. First, as large suppliers of equity capital, they have enormous influence over a significant percentage of securities traded, thereby directly impacting the market price of stock. This certainly gives them substantive leverage in negotiation with a firm's management. As large capital providers, they have significant power to alter a firm's cost of capital, a vital input in a firm's capital structure and a major component of firm valuation. Second, because of their large percentage shareholdings, institutional investors hold substantial voting rights that can be used to influence management's strategic decisions.

10. According to the Financial Economists' Roundtable (1999) Statement on Institutional Investors and Corporate Governance, a larger economic stake in a corporation provides greater incentive to institutions to oversee management action. Large owners fully capture the economic benefits from their activism and perceive their oversight activities as cost effective. In an interview with investment managers from four different institutions, the managers emphasized that they spend much time and effort in information collection and in-house analysis to improve portfolio performance and to satisfy their fiduciary responsibilities (El-Gazzar, 1998).
11. Kaplan and Minton (1994) suggest that blockholder ownership helps control agency problems. Beasley and Salterio (2001) contend that blockholders act as an alternative monitoring mechanism to the audit, thereby reducing the need for monitoring by the audit committee and, presumably, the degree of audit intensity demanded from the auditor. In another influential study, Dechow *et al.* (1996) observe that firms subject to the SEC's enforcement actions are less likely to have outside blockholders and more likely to have their board of directors dominated by management. They suggest that a firm's ownership structure impacts its earnings management decisions, and sophisticated investors are more likely to expose such earnings manipulation in financial reporting.
12. Shleifer and Vishny (1986) suggest that the outside blockholders may also have representatives on the board of directors or have the potential power to influence the activities of the board of directors. The threat of dismissal of top managers is another method for alleviating the agency problem that arises because of the separation between ownership and control. The fear of antagonizing influential blockholders could encourage managers to act in the best interest of shareholders. Shleifer and Vishny (1986) refer to the ability of large shareholders to influence management as "jawboning."
13. We conjecture that in spite of the presence of sophisticated large institutional investors, such as pension funds, mutual funds, or insurance companies, in the firm's shareholder mix, ICW may continue to exist in a firm similar to a situation where in spite of high-quality external

audits over time, a firm may still encounter several control weaknesses in the financial reporting process. Large shareholders' investment in a firm is a complex process and varies systematically with many firm-specific factors (Duggal and Millar, 1999; Demsetz and Lehn, 1985). For example, institutional investors have a greater preference for large firms (Hessel and Norman, 1992), and for firms having a high-quality information environment (Cready, 1994; Potter, 1992; Aggarwal and Rao, 1990). However, our point of interest is whether, upon ICW detection and reporting, institutional and other large investors influence management's timely remediation action to improve the reliability of reported information.

14. In our main analysis, the dependent variable is both categorical and ordinal. In the additional analyses, we also use the same regression model with the categorical data (1 and 0) as the dependent variables in the tests using the alternative measures of timeliness of ICW remediation, i.e. FAST versus SLOW, FAST versus NO, and SLOW versus NO.
15. Our choice of at least 5 percent individual shareholding threshold to define concentrated stock ownership or block shareholding is based on prior literature where an external blockholder or large shareholder is defined as one who individually owns 5 percent or more outstanding equity shares (Eng and Mak, 2003; Core *et al.*, 1999; Shleifer and Vishny, 1986). This 5 percent individual shareholding is also based on the SEC's Rules 13D and 13G requiring that any person or group of persons who acquire a beneficial ownership of 5 percent or more equity securities must file a schedule 13D or 13G (depending on the category of investors). The Corporate Library and Compact Disclosure databases provide the information on total percentage shareholdings by those large shareholders individually owning at least 5 percent outstanding common stock, which we use as the measures of concentrated institutional (CONC_INST) and non-institutional shareholdings (BLOCK_NINST). DIFF_INST is the difference between total institutional percentage shareholdings and the shareholdings by concentrated institutional stockowners. The Corporate Library database separately provides the information about substantial stockholdings by large investors or investor groups (it includes both institutional and non-institutional shareholders) with at least 20 percent individual common stock ownership.
16. Data for the board and audit committee governance variables are collected from annual proxy statements in conjunction with the Audit Analytics and Corporate Library databases; data for stock ownership variables are obtained from the Corporate Library and Compact Disclosure databases; and data for the firm-specific variables are obtained from the Compustat database.
17. For example, with regard to the ICW reported for the first time in 2004, the governance variables for the FAST and SLOW remediation firms are measured at the fiscal year-end in 2005 and 2006, respectively; for the NO remediation firms, governance variables are measured at the fiscal year-end in 2006.
18. Many of the firm-specific control variables such as LTA, GROWTH, RESTRUCT and SEGMENT are used by other prior studies (Li *et al.*, 2010; Johnstone *et al.*, 2011).
19. The sample firms are all accelerated filers (i.e. companies with \$75 million or more in public float) required to submit their internal control reports pursuant to 404 for their fiscal year ending on or after November 15, 2004. Use of accelerated filers may bias the sample toward larger firms having better internal controls; however, this situation is offset by including only ICW firms having ineffective internal control system (Goh, 2009). Furthermore, Ashbaugh-Skaife *et al.* (2008) determine whether firms remediate their control weaknesses, from their subsequent unqualified SOX 404 audit opinions because unqualified SOX 404 audit opinions objectively show that the firms have fully remedied their ICW and thus help determine the timeliness of the remediation process.

20. For more discussion on this classification, see page 174 of Ashbaugh-Skaife *et al.* (2007). Inclusion of the firms audited only by dominant audit suppliers in the sample controls for the effect of audit quality on the ICW remediation in the analyses.
21. Ashbaugh-Skaife *et al.* (2007) contend that SOX 302 internal control disclosures are subject to less regulations and allow more management discretion than control disclosures made during the SOX 404 period. They further contend that under SOX 302, the review of internal controls is subject to less scrutiny by both management and auditor, and the disclosure rules are less specific than those that exist under SOX 404. This means that managers have more discretion in disclosing internal control deficiencies during the pre-SOX 404 regime.
22. It is difficult to trace the timing of the resolution of individual ICW within a fiscal period from both management's and auditor's reports which often contain a list of control weaknesses. Hence, similar to Goh (2009), we consider remediation of ICW in their entirety, and focus on qualified and unqualified SOX 404 audit opinions. We define ICW firms as NO remediators if they fail to remediate their ICW within the time horizon of two years from the first year of ICW reporting. We have also identified 29 ICW firms that remediate their ICW in one year but have different types of ICW surfaced in the next year. In such a situation, those ICW firms are not considered to have resolved their control problems within the specified time horizon and are included in the category of NO remediation firms. As a robustness check, we conduct additional tests by excluding those firms and find that our results remain unaffected by such exclusion.
23. It is noteworthy that the bond-rating agencies indicate that they would respond differently to the types of weaknesses, whether it is systematic (pervasive) or nonsystematic (nonpervasive). Fitch Ratings (2005) classifies certain ICW as pervasive/systematic. They note, "Certain material weaknesses might constitute pervasive risk, such as problems with 'tone at the top' or the quality of personnel in charge of the financial reporting functions [...]. Rating for companies not previously identified as having such pervasive weaknesses by Fitch will need to be looked at carefully, and negative action is likely [...]. Material weaknesses in internal controls can also occur at the transaction level, potentially affecting information such as specific account balances." Similarly, Moody's Investors Service (2004) states that material weaknesses will be classified as Type A for account/transaction non-systematic weaknesses and Type B for systematic weaknesses, and their impact on bond ratings will be different. The adverse consequences are more likely to follow for the Type B ICW.
24. For the FAST versus NO analysis, we drop SLOW remediation firms and define the dependent variable as an indicator variable of 1 if the firm remediates its ICW within the first year after the year of ICW reporting and 0 otherwise; for the SLOW versus NO analysis, we drop FAST remediation firms and define the dependent variable as an indicator variable of 1 if the firm remediates its ICW within the second year after the year of ICW reporting and 0 otherwise; for the FAST versus SLOW analysis, we drop NO remediation firms, and use the dependent variable as an indicator variable of 1 if the firm remediates its ICW within the first year after the year of ICW reporting and 0 otherwise.
25. As a part of the robustness check, we use two alternative measures of managerial and institutional stock ownership. Following Chung *et al.* (2002) that institutions with substantial shareholdings have greater incentives and abilities to monitor corporate affairs and curtail management's opportunistic reporting behavior, we classify the institutional stock ownership variables into two groups based on median. The observations greater than median (coded as 1 and defined as INST) implies that the firms are deemed to have substantial institutional shareholders who have stronger incentives to monitor and to influence management action to remediate ICW. Similarly, based on prior research observations (Jensen and Meckling, 1976; Warfield *et al.*, 1995; Gul *et al.*, 2003) that an

increase in managerial ownership reduces agency problems arising out of the separation of ownership and control and induces managers to work more toward maximizing long-term value of a firm, we reconstruct the managerial stock ownership variable into high and low on the basis of median. The observations greater than median (coded as 1 and defined as PMGR) implies that managers are deemed to have substantial ownership stakes in an entity and assumed to take prompt action to remediate ICW in subsequent fiscal period. We replace the original ownership variables with the new ones and repeat the main tests. The results show that the ICW firms with greater than median managerial and institutional stock ownership take relatively prompt action to remediate their ICW than the firms with less than median managerial and institutional stock ownership.

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Appendix. Classification of ICW

We consider the criteria applied by Doyle *et al.* (2007b, a) and Raghunandan and Rama (2006) in classifying ICW reported under SOX 404 into company-level and account-specific control weaknesses. The company-level weaknesses are less auditable and relate to the overall company-level control environment, whereas account-specific weaknesses are more auditable and relate to specific accounts and/or transactions. We read both management's and auditors' reports on internal control over financial reporting to develop a better sense of the nature of weaknesses so that they could properly be classified as company-level and account-specific control weaknesses as far as practicable.

ICW at the company-level relate to:

- quality and training of accounting personnel;
- segregation of duties;
- reconciliation of accounts and financial statement preparation;
- information systems-related problems;

- quality of internal audit or audit committee;
- inconsistencies in the application of company policies among business units and segments;
- material weaknesses in the interpretation and application of complex accounting standards, such as standards related to hedge transactions;
- weak internal controls related to contracting parties;
- deficiencies related to the design of policies and execution of processes relating to accounting for transactions; and
- deficiencies in the period-end reporting process.

In addition to the above, we consider the following two additional broad criteria to classify ICW as company-level ICW (Doyle *et al.*, 2007a):

- (1) override by senior management; and
- (2) ineffective control environment.

However, disclosures of ICW are not very clear-cut for many sample firms. Hence, in addition to evaluating whether ICW relate to one or more of the above areas, we consider a cutoff point of at least three account-specific internal control problems to classify a firm as having company-level ICW (Doyle *et al.*, 2007a).

Account-specific ICW relate to specific transactions or accounts, namely:

- inadequate controls for income tax accounting including deferred income taxes; problems in proper reconciliations between book and tax income;
- inadequate internal controls for accounting for loss contingencies;
- inadequate controls for accounting for receivables including bad debts;
- revenue recognition problems;
- deficiencies in the documentation of receivables securitization program; and
- inadequate internal controls over the application of new accounting principles or existing accounting principles to new transactions.

If the number of ICW is restricted to one or two without any other control weaknesses at the company-level, we classify a firm as having account-specific control weaknesses. However, if a firm has either company-level ICW or both accounts-specific and company-level ICW, it is classified as having company-level ICW. All other firms are classified as having account-specific ICW.

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