

Audit Firms, Audit Committees and Remediation Efficiency of Material Weakness in Internal Control

Abstract

This research examines the association between the characteristics of audit firms, audit committees and remediation of internal control deficiencies. By measuring improvement of internal control qualities as remedial efficiency and dividing samples into three partitions, we find low remedial efficiency is associated with less financial expertise, lower attending frequencies, smaller audit committee size, higher audit fees, lower non-audit fees and audited by non-Big 4. Also, we find firms with smaller size, financial distress, rapid growth in business or operating in a less litigious environment do not remedy the internal control weakness in a timely manner. The study contributes to our understanding of key determinants to timeliness in correcting internal control weakness.

Keywords

Audit Firms, Audit Committees, ICOFR, Internal Control Deficiency, Remedial Efficiency, SOX 404

Introduction

Audit firms and audit committees, which participate in governance and complete the internal control monitoring, should be related to when remediation of internal control deficiencies are completed. Numerous studies have attempted to investigate when a firm may disclose weaknesses in internal control (Krishnan, 2005; Doyle et al., 2006), however, there has been little discussion of when a firm may complete the remedy of internal control weaknesses. A firm with low remedial efficiency may indicate weak corporate governance or weak monitoring mechanism and results in financial statement misstatement. Thus, understanding what factors lead to low remedial efficiency of internal control improving process would be important.

In 1988, Statement on Auditing Standards No.55 (SAS No.55) and No.60 (SAS No.60) had required external auditors to consider internal control system and report any significant internal control deficiencies that could affect financial reporting to the

audit committee¹. SAS develop linkage between auditors, audit committee and internal control systems and Sarbanes-Oxley Act 2002 (SOX 2002) enhance the linkage². The Securities Exchange Commission (SEC) imposed new responsibilities and penalties to audit firms, audit committees and the management through the SOX to increase the internal control quality. Audit firms and audit committees have to review the operation of internal control over financial reporting (ICOFR) and communicate any noted deficiencies to the management to ensure prompt corrections will be made. Thus, a well-characterized audit firm and audit committee, i.e., highly effective monitoring system, can promote the management to make timely corrections toward the deficiency of ICOFR.

Under Section 404 of the SOX (SOX 404), the audit firms are required to issue a new public report to assert whether the company's ICOFR is effective or not³. An adverse opinion means that a company does not design or maintain their internal control mechanism properly and some accounting errors or financial fraud may occur. Some companies take prompt actions to remedy the internal control weakness, but some do not. We are interested in investigating the determinants of the remedial efficiency of internal control improving process in post-Sarbanes-Oxley (post-SOX) era. Ashbaugh-Skaife et al. (2008) said internal control deficiencies are generally considered that a company has unreliable accrual amounts, that is, a financial report might not be reliable. Especially when a firm with internal control deficiencies for several consecutive years, it might send messages that corporate governance is weak and investors would in turn act against this to protect themselves. Remedial efficiencies be categorized into three levels in our research. We measure a firm as no remediation when it receives adverse opinions for two consecutive years, as low remedial efficiency when it receives adverse opinion followed by unqualified one in the next year and as high remedial efficiency when it receives unqualified opinions for two consecutive years. In most circumstances, a company has clean opinions of internal control does not mean that it does not has weakness but indicates a firm can correct their weakness promptly. Thus, we use two consecutive unqualified internal control opinions to proxy high remedial efficiency.

We directly observe the opinion of internal control quality under the Sarbanes-Oxley Act 404 (SOX 404) and measure the improvement of internal control quality as a comparison of a base year and the next year. An adverse SOX 404

¹ SAS No.55 was amended by SAS No.78 in 1995 and superseded by SAS No.109 in 2006. SAS No.60 was superseded by SAS No.115 in 2008.

² Under section 301 of the SOX, the audit committee shall be directly responsible for the appointment, compensation, and oversight of the work of accounting firm. Under section 404 of the SOX, auditor attestation of internal control over financial reporting is required.

³ An adverse opinion on ICOFR indicates a material weakness of internal control and an unqualified one indicates internal control is effective.

opinion followed by an unqualified one in the next year will be viewed as remedy their internal control deficiencies instantly. We will investigate what characteristics of audit firms and audit committees lead to an immediate remediation of internal control weakness.

Audit committee is a crucial internal control mechanism responsible for monitoring the implement of ICOFR. It pushes the management to continually and promptly take actions to improve internal control qualities. The SOX gave new power and responsibilities to audit committee. Auditor engagement, audit and non-audit services must be approved by audit committee. Under SOX (2002), audit committee members are required to be independent and include at least one financial expertise. We believe that some other factors are also critical to the qualities of audit committee. We measure the quality of the audit committee by the percentage of financial expertise (Raghunandan et al., 2001; Krishnan, 2005; Krishnan and Visvanathan, 2007b), attending frequencies (Krishnan and Visvanathan, 2007a; Zhang et al., 2007; Goh, 2009), average number of outside directorships in other firms held and audit committee size (Abbott et al., 2004; Krishnan, 2005; Goh, 2009). As for government, we believe this would provide guidance of regulation implementation on companies' audit committees.

Audit firms serve as external monitors to directly check the entire internal control systems and they must consider a company's internal control when planning and performing field works⁴. Several studies found auditors with some characteristics tend not to disclose the deficiencies under some circumstances (DeAngelo, 1981; Geiger and Raghunandan, 2002; Srinidhi and Gul, 2007; Lim and Tan, 2007; Hogan and Wilkins, 2008). Big 4 are believed to have higher audit qualities because they have more resources and often are specialists in industry. We incorporate Big 4 as a dummy in our model to examine if it associates with remedial efficiencies. Simunic (1980) said audit fees could serve as inputs of audit firms. We believe the management improves qualities of ICOFR more timeliness if auditors devote more efforts. Due to independence concern, the SOX requires that fees of non-audit services that exceed 5% of total revenues paid by the issuer to the audit firm should be approved by audit committee and eight categories of non-audit services are not allowed. Purchasing non-audit services may help improve operations of internal control systems and turn companies more competitive. We suggest that audit fees and non-audit fees associate with remedial efficiencies. In an initial audit engagement, the auditor would not have

⁴ For example, Hogan and Wilkins (2008) found auditors would increase substantive testing to reduce their detection risk when control risk assessed high. Thus, understanding the improvement of internal control qualities could be important to auditors when developing and performing audit programs. Gaumnitz et al. (1982) said evaluation of internal control was a basic work before field works began. They believed the judgment of internal control prior to audit process would determine how much effort the audit firms would devote.

previously obtained knowledge of clients and need more time to learn about companies, therefore, an initial audit may defer remediation (Geiger and Raghunandan, 2002). We analyze the impact of initial audit engagement on remedial efficiencies.

Goh (2009) studied how audit committees and boards of directors were related to remediation of material weakness in internal control but did not examine the influence of external auditors. We believe the characteristics of audit firms could also dominate the remedial efficiency of internal control improving process. Audit firms are responsible to discover and disclose the deficiencies. The auditors with poor ability to detect material weakness would delay the remediation and even worse case if they detect it and choose not to disclose it to the top. To examine when a firm would complete remedial process by concerning external monitoring mechanism is our contribution.

In our research, we divide companies into three partitions i.e. high remedial efficiency (Fast remediator), low remedial efficiency (Slow remediator) and no remediation (Non remediator). We find that firms could improve their remedial efficiencies by enlarging their audit committee size and including more financial expertise in the audit committee. Also, the firms could require audit committee members to attend meetings frequently to achieve quicker remediation of material weakness. Firms with low remedial efficiency if they had lower non-audit fees, higher audit fees and audited by non-Big 4 auditors. The results showed that purchasing more non-audit services could improve internal control qualities in a timely manner but not paying higher audit fees. Hogan and Wilkins (2008) found higher audit fees are related to higher opportunities to disclose internal control deficiencies, too. Companies were also more likely to be a Slow remediator if they were smaller, suffering financial distress, or growing rapidly. In addition, firms operated business in a more litigious environment remedied their internal control weakness more quickly.

The next section describes the hypothesis and research method. In Section 3, we contain our empirical findings and discuss the results. Section 4 is our conclusions.

Hypothesis and Research Method

The Committee of Sponsoring Organizations of the Treadway Commission issued a report⁵ (COSO report 1992) provided a framework of criterion for different kinds of

⁵ COSO report recommended a well established framework of internal control should include five elements i.e. the control environment, risk assessment, control activities, information and communication, and monitoring (COSO 1992). With regard to control activities, COSO suggested three

organizations to evaluate the efficiency of internal control systems⁶ and the SOX put it further to require the management to express an opinion on the effectiveness of ICOFR. Before the SOX, the regulations with respect to companies' internal control were very limited in scope and the public could hardly obtain information connected to ICOFR from annual reports or any other public disclosures. In order to force companies to issue faithful financial reports, the SOX were centering on regulating internal control issues especially in SOX Section 302 (SOX 302) and 404 (SOX 404). From the SOX, we realized the management, audit firms and audit committees were playing important roles in monitoring ICOFR.

Audit committees

Under SOX, the primary role of audit committee concentrates on monitoring and reviewing the ICOFR. The SOX Section 301 (SOX 301) gives audit committee responsibilities and authorities for monitoring auditors to prepare or issue audit reports. Besides, audit committee has to report the issues of weakness and make recommendations to the board to help the management comply with the requirement of the SOX 302. Several researches have studied the determinants of internal control quality but few investigated the remedial efficiencies of internal control improving process. A lot of researches have found qualities of audit committee to be positively related to internal control quality (Krishnan, 2005; Zhang et al., 2007; Goh, 2009). We believe that higher qualities of audit committees would be more likely to discover and disclose internal control deficiencies promptly to help the management express appropriate opinions under the SOX 302 regime. Therefore, we have the following hypothesis:

HYPOTHESIS 1: There is a negative relation between the quality of the audit committee and firms' timeliness in the remediation of material weaknesses.

Under the SOX 404, if a company has material weakness in ICOFR, it would receive an adverse opinion on its internal control. We use three categories to describe the timeliness of weakness remediation (*Remedied*). It equals to 2 if a firm receives an unqualified SOX 404 opinion in the first and second year (Fast remediator). It equals to 1 if a firm has material weakness in the first year but remedies it in the second year

essential controls. One is about "operations" to ensure the effectiveness and efficiency of business activities, another is "financial reporting" to ensure its reliability and the other is "laws and regulations" to ensure all activities are compliance with government policies. Furthermore, COSO (1992) defined internal control as "a process, affected by an entity's board of directors, management and other personnel, designed to provide reasonable assurance regarding the achievement of objectives."

⁶ COSO (1992) established a common definition serving the needs of different parties and provided a standard against which business and other entities — large or small, in the public or private sector, for profit or not — could assess their control systems and determine how to improve them.

(Slow remediator). It equals to 0 if a firm receives an adverse SOX 404 opinion in the first and second year (Non remediator).

We proxy qualities of the audit committee by financial expertise (Raghunandan et al., 2001; Krishnan, 2005; Krishnan and Visvanathan, 2007b), attending frequencies (Krishnan and Visvanathan, 2007a; Zhang et al., 2007; Goh, 2009), average number of outside directorships held and audit committee size (Abbott et al., 2004; Krishnan, 2005; Goh, 2009). Krishnan (2005) believed that audit committee size, independence and financial expertise could proxy audit committee quality and found audit committee members who possessed independence and financial background do timely push companies to remedy their weakness. In SOX 407, it requires that audit committee should be composed of at least one financial expertise. To include financial expertise in the committee may help other members understand the financial assumptions, accounting rules and meanings of financial numbers. In 2003, SEC broadened the definition of financial expertise from accounting financial expertise to non-accounting financial expertise because non-accounting financial expertise also encompassed characteristics relevant to the functions of providing professional advices and monitoring progress on financial activities for ensuring no errors or fraud occurred to violate government regulations or to block company's success. Non-accounting financial expertise are also characterized by asking insightful questions of the company's financial statements and accompanying footnotes as well as accounting financial expertise. Goh (2009) found non-accounting financial expertise help remedy material weakness in a timely manner. Although several studies have found non-accounting financial expertise not as competent as accounting financial expertise (Bedard et al., 2004; DeFond et al., 2005; Dhaliwal et al., 2006), Zhang et al. (2007) has found accounting and non-accounting financial expertise both significantly decrease the internal control weakness. Raghunandan et al. (2001) found audit committee members having accounting or financial backgrounds are more likely to review internal audit process or results and spend more time on discussing things with internal auditors. Krishnan and Visvanathan (2007a) found that the accounting financial expertise could perform their monitoring function effectively to lead companies to a higher financial quality if the boards were characterized by strong governance. Therefore, we believe accounting and non-accounting financial expertise both associate to timely remediation of material weakness in ICFR and we include both in our financial expertise variable (*Expert*). The meeting frequency has important implications for corporate governance because it is easier for a firm to change its annual audit committee meeting activities than to change the size, composition or other monitoring mechanism. Zhang et al. (2007) and Goh (2009) took meeting frequencies as a measure of audit committee quality and found limited evidence

associated to internal control weakness. Although meeting more frequently can help timely evaluate the effectiveness of internal control, attending more frequently is also crucial. Members with more attending frequencies could carry out the duties of reviewing or monitoring. Thus, in our study, we investigate the influences of attending frequencies (*Attend*) on *Remedied*. Holding multiple directorships in other companies would distract audit committee members but the strength was that they could learn and accumulate more knowledge and experiences from reviewing or monitoring other companies. We are interested in if members holding multiple directorships (*Direct*) are associated with *Remedied*. Abbott et al. (2004) found no evidence between audit committee size and financial report restatement, but Goh (2009) found audit committee size lead companies to achieve good ICOFR. We incorporate audit committee size (*CommSize*) into our model.

Audit firms

Krishnan (2005) said some other monitoring mechanism were functions of qualities of internal control except the board and audit committee. We believe that audit firms could be an important governance-related control. In 1988, SAS No.55 require auditors to consider internal control structure in a financial statement audit and SAS No.60 require audit firms to report significant deficiencies on ICOFR to the audit committee. After SOX 404 implementation, audit firms not only have to consider the effectiveness of internal controls but also are required to express an opinion on it. The ability of audit firms to discover and disclose the internal control deficiencies will affect the remedial efficiency. We believe that characteristics of audit firms influence the remediation of internal control weakness. Therefore, we have the following hypothesis:

HYPOTHESIS 2: There is no relation between the characteristics of the audit firms and firms' timeliness in the remediation of material weaknesses.

Many researches indicated that Big N auditors (Big 8, 6, 5, 4) provided higher quality services than other audit firms (Palmrose, 1988; Beatty, 1989; Teoh and Wong, 1993; Craswell et al., 1995; Becker et al., 1998). Failure in the operation of designed internal controls over a significant account or process could cause audit failure and impair auditors' reputation. Investors believe that larger audit firms have higher probability to discover and report deficiencies because each client of them is only a small fraction of their total quasi-rents (DeAngelo, 1981). Bigger auditors are perceived to be of higher quality to discover and ask their clients to correct their deficiencies timely and are believed to offer greater in-house experience compared to non-Big N so we use Big 4 (*Big 4*) as a dummy variable to investigate the influence on internal control remedial efficiencies. We suggest that the disclosure of internal

control weaknesses is less detrimental for a Big 4 auditor because being terminated by a client may only impair a small part of their whole revenue so *Big 4* should have impact on remedial efficiencies. Hogan and Wilkins (2008) found that firms reported higher audit fees prior to the year of disclosing internal control deficiencies. They said firms which presented internal control deficiencies associated with higher audit fees because of remedial efforts. Because higher audit fees could mean intensive remedial efforts and result in timely remediation of internal control weakness, we incorporate audit fees (*Auditfee*) into our model. Although the SOX 201 prohibits auditors from providing eight categories of non-audit services in order to compromise auditor independence, non-audit services are still believed to have influences on audit quality. Lim and Tan (2008) found non-audit services impaired audit quality only when auditors were not industry specialists. Conversely, Cho et al. (2006) found non-audit service fees positively increased the value relevance of accounting information. We examine if non-audit services enhance firm value by remedying their material weakness timely. The initial audit engagement also presents some considerations. When the auditors engage a new client, they are not familiar with clients' business and have to carry out some certain procedures to ensure they gain a thorough understanding of the entity. Geiger and Raghunandan (2002) suggested that new auditors were likely to be less aggressive because they lacked knowledge of client-specific risks. We interpreted it as they might be unaware of the client-specific risks and this lack of knowledge led to the issuance of nonqualified opinions. The above may let new auditors be unable to discover and remedy the material internal control weakness timely so we investigate if the initial engagement (*Initial*) has impact on remedial efficiencies.

We extend the empirical model of Goh (2009) to test our hypotheses and the ordered logistic regression model will be used (Long, 1997):

$$P(\text{remedied}) = a + b_1Lnta + b_2Roa + b_3Distress + b_4Foreign + b_5Growth + b_6Restruct + b_7MA + b_8Litigat + b_9Expert + b_{10}Attend + b_{11}Direct + b_{12}CommSize + b_{13}BigN + b_{14}AuditFee + b_{15}NonauditFee + b_{16}Initial + e$$

Typically, large firms are likely to have more adequate financial reporting processes and procedures in place because regulations execute more strictly laws on large firms. We measure size by log of average total assets (DeFond and Jiambalvo, 1991; Krishnan, 2005). Less profit could create potential problems. Firms would allocate resources away from remediation of internal control deficiencies and assign the resources to boost profits to meet the specific requirements of contracts or company's objectives. Ge and McVay (2005) found smaller and less profitable firms would be more likely to disclose material weaknesses. We use *LNTA* and *ROA* to

proxy companies' size and profitability. Firms with financial distress could also drive firms to give little attention to correct material weakness of ICOFR because they would be busy dealing with legal procedures, market reactions, creditors, competitors, etc. We incorporate financial distress (*Distress*) into our model and measure it by what Zmijewski (1984) has suggested. Foreign currency translation adjustment (*Foreign*) contains some information like the firm's business strategy and operation complexity. Additional training will be provided to personnel who record or are responsible for the related review of foreign currency cumulative translation adjustments. Appropriate control would help completely and accurately record the impact of the cumulative translation adjustments of foreign subsidiaries. Higher foreign currency cumulative translation adjustments mean higher operation complexities and need additional controls to ensure cumulative translation adjustments be recorded completely and accurately. We hypothesize that high foreign currency cumulative translation adjustments are associated with low remedial efficiency. Sometimes, firms experience sales growth without corresponding controls growth which can increase the risk of fraud or inefficiencies. McVay (2007) found firms growing rapidly would be more likely to involve in internal control deficiencies. Growth rate and investment strategy are inseparable and higher investment may squeeze out resources, causing companies suffering lower remedial efficiency. We use changing of sales during remediation period (*Growth*) to measure growth rate to find out its influences. Ashbaugh-Skaife et al. (2007) found that firms which reported internal control deficiencies had more organizational restructurings or acquisitions and ended with fewer resources available for internal control. Thus, we include *Restructure* and *MA* to proxy factors which lead firms to have difficulties in remedying internal control problems. Some companies have to enhance their legal protection because they run their business in a litigious environment (*Litigat*). Maintaining an adequate ICOFR would protect them from entering lawsuits. We examine if companies in a litigious environment remedy their material weakness of internal control in a timely manner. Table 1 presents the definitions of variables.

(Insert Table 1 here)

In Table 2, Panel A provides the details for the sample selection. Our initial samples are from Auditanalytics and SOX 404 internal control opinions are available over the period 2005-2008. This yields 11,622 observations. We exclude 280 firms receiving adverse opinions in the first year. We acquire initial engagement information, audit and non-audit fees from Auditanalytics. We retrieve all financial information and merger and acquisition information from COMPUSTAT and obtain audit committee information from RiskMetrics. There are only about 1,500 companies each year in Directors File of RiskMetrics, therefore, we drop 8,957 companies

mostly due to unavailable data in RiskMetrics. Our final samples are 2,385. In Panel B, we show the final sample distribution.

(Insert Table 2 here)

Empirical Results

Descriptive statistics and univariate analysis

Table 3 presents the descriptive statistics for the full sample and its partitions by the remedial efficiencies. It also presents two-tailed tests of differences in means between any two groups of remediators. According to firm-specific control variables, *Lnta* is significant between any two groups. Fast remediators have significant higher means than Slow and Non remediators at the 1% level. The results indicate that firms with large size remedy the material weakness in a timely manner. Fast remediators have lower values for *Distress* than Slow and Non remediators. Companies with financial distress may be constrained and have less resource to carry out remedial programs. Limited resources hinder remedial progress because resources are allocated to meet some obligations or requirements. Fast remediators also have significantly higher *Foreign* than Slow and Non ones, suggesting that Fast remediators are accompanied by more adequate control systems associated with overseas business. The differences of mean on *Restrct* of Fast remediators are significantly higher than Slow and Non remediators. Surprisingly, our findings imply that firms with restructuring charges appearing to experience organization rebuilding still remedy their deficiencies quickly, which is different from Goh (2009). According to *MA*, Fast and Slow remediators participate less in merger and acquisitions than Non remediators. As to *Litigat*, Fast and Slow remediators tend to be in a more litigious environment than Non remediators. It means firms seem to remedy the deficiencies timely to decrease their potential litigation risks if they locate in a litigious industry.

The results for the audit committee and audit firm variables provide some preliminary evidence for Hypothesis 1 and Hypothesis 2. Surprisingly, *Expert* of Fast and Slow remediators is significantly lower than Non remediators. The results indicate that more financial expertises do not often promise timely remediation of material weakness in internal control. Table 3 also shows that audit committee members in Fast and Slow remediators attend meetings frequently, comparing to Non remediators, i.e., Fast and Slow remediators have more audit committee members willing to attend meetings to oversee the quality and integrity of the company's financial information. Therefore, most committee members in Fast and Slow remediators carry out its oversight responsibilities over the work of the management

to push them to make up for the deficiencies but committee members of Non remediators do not. As we can see, audit committee members of Fast and Slow remediators hold more directorships in other companies than Non remediators. The results indicate audit committee members gain extra experiences or knowledge from holding other directorships and provide of great benefit to remedial efficiencies. *Commsize* is significant between any two groups. Fast and Slow remediators tend to set larger audit committees than Non remediators. Hence, firms can enlarge audit committee to put pressure on the management to maintain the internal control systems operating properly.

Big 4 of Fast and Slow remediators are significantly higher than Non remediators. The above indicate that if firms want to remedy their internal control weakness in a timely manner, they can achieve it by hiring Big 4. Remediators are also differential in *Auditfee*. Fast remediators pay higher audit fees than Slow remediators. The results show that Fast remediators correct their internal control deficiencies more timely by purchasing more audit services.

(Insert Table 3 here)

Multivariate analysis

We use the ordered logistic regression models to test our hypotheses that audit firms and audit committee are related to remediation of internal control weaknesses and Table 4 reports the regression results. We use the restricted and the full models to illustrate the effects of audit firms and audit committee variables on firms' timeliness in the remediation of material weakness. In model 1, we find *Lnta*, *Distress*, *Growth*, *Restruct*, *MA* and *Litigat* are significant. The results show that firms with large size, lower growth rates and operating in a litigious environment correct their material weakness fast. Besides, firms with financial difficulty or occurring mergers and acquisitions remedy deficiencies slower. Surprisingly, firms_involving higher restructuring charges during the remediation period remedy the weakness timely. It may be due to the reason that firms often involve lots of efforts during organization rebuilding. In Model 2, we regresses *Remedied* on audit committee characteristics (*Expert*, *Attend*, *Direct*, and *Commsize*) in the presence of other firm-specific control variables but without audit firm variables. Results of firm-specific variables are significant and consistent with Model 1 except for *MA*. Moreover, we find *Attend* and *Commsize* significantly influence remedial efficiencies. Higher attending frequencies and bigger audit committee size help improve internal control qualities in a timely manner. We do not find the relation between *Remedied* and *Expert* or *Direct* in Model 2. The results may provide the government some suggestions if including at least one financial expertise in the audit committee is necessary. In addition, the explanatory

power increases about 1% in Model 2.

Model 3 regresses *Remedied* on the firm-specific factors and audit firm variables and the results of firm-specific variables are almost consistent to Model 2 except for *Restruct*. We find that *Big 4*, *Auditfee* and *Nonauditfee* are significant. Paying higher non-audit fees and purchasing audit services from Big 4 accelerate weakness remediation but higher audit fees lead to slower remediation. Hogan and Wilkins (2008) also found that higher audit fees led companies to disclose internal control deficiencies. The explanatory power increases about 4% from Model 2 to Model 3 so external auditors may play key roles in urging companies to remedy their internal control problems compared to what audit committee do. Model 4 regresses *Remedied* on the audit committee and audit firm-related variables in the presence of other firm-specific control variables. As to audit committee variables, *Expert*, *Attend* and *Commsize* are significant. Companies can accelerate their remedial efficiencies by including more financial expertise and enlarging the audit committee size. Furthermore, they can also achieve it by requiring audit committee members to attend meetings more frequently. *Big 4*, *Auditfee* and *Nonauditfee* are significantly implying that the audit firm-related variables are important factors in explaining remedial efficiencies even when the effects of audit committee variables are incorporated into the analysis. According to Model 4, we suggest that with a decrease in audit fees, an increase in non-audit fees and hiring Big 4, auditors urge companies to remedy internal control weakness timeliness. The results of firm-specific variables remain robust even in the presence of audit committee and audit firm-related variables.

(Insert Table 4 here)

Robustness analysis

We perform some additional tests to verify that our results in Table 4 are robust. We define three alternative measures of remedial efficiencies. First, we drop the Slow remediators and define the dependent variable as an indicator variable that equals 1 if the firm receive an unqualified internal control opinion in the first year, and 0 if the firm fails to receive an unqualified internal control opinion for two consecutive years. Second, we combine the Slow and Non remediators, and define the dependent variable as an indicator variable that equals 1 if the firm receives an unqualified internal control opinion in the first year, and 0 otherwise. Third, we combine the Fast and Slow remediators and define the dependent variable as an indicator variable that equals 1 if the firm receives an unqualified internal control opinion in the second year, and 0 otherwise. The binary logistic regression results are presented in Models 1, 2, and 3 of Table 5, respectively. The coefficient on *Distress*, *Big 4* and *Auditfee* in model 1, 2, and 3 of Table 5 are generally consistent with Model 4 of Table 4. The

above results indicate that big-4 auditors or auditors devoted more efforts to audit lead to higher remedial efficiencies. Finally, the coefficients on *Expert* and *Commsize* are not consistent with the results in Model 4 of Table 4. The influences of audit committee on remedial efficiencies are not clear. Our robust tests show that audit firm-related characteristics have more clear relation to remedial efficiencies than characteristics of audit committee do.

(Insert Table 5 here)

Conclusion

The study investigates the empirical relationship between characteristics of audit firm, audit committee and remedial efficiency of internal control improving process. Firms are more likely to be a slower remediator of internal control weakness if they have less financial expertise, lower attending frequencies, smaller audit committee, lower non-audit fees, higher audit fees and are audited by non-Big 4. They are also more likely to be a slower remediator if they are smaller and suffering financial distress and growing rapidly. In addition, firms in an industry which participates in less litigation have slower remediation. We believe our results shed light on the regulations associated with audit committees and audit firms. The findings lead us to think over if the regulations or requirements are necessary or need to be revised.

This study has some limitations. The sample in this study decreases rapidly due to missing data in RiskMetrics and this may bias our results. Furthermore, some relations and directions are unclear so the results should be interpreted with care.

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Graph 1
Conceptual Diagram

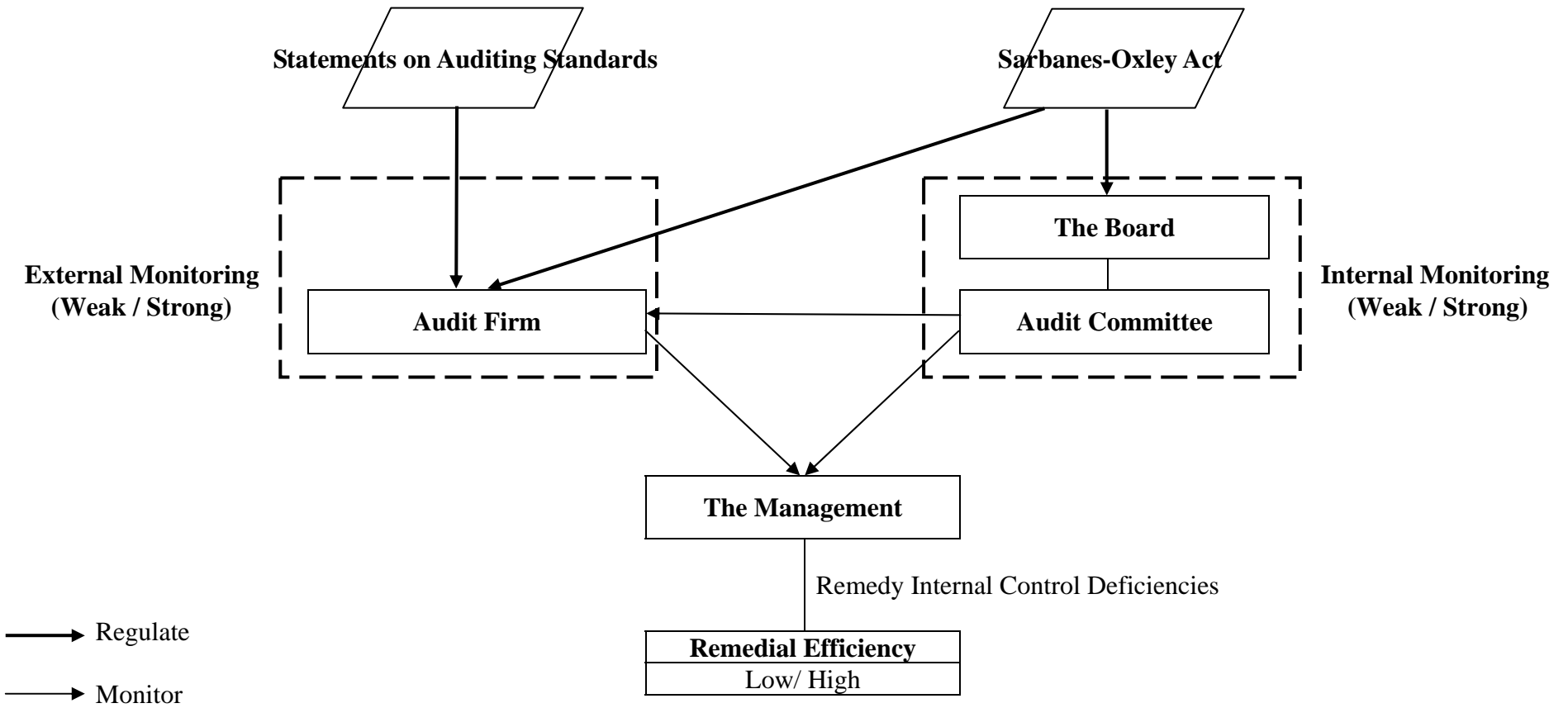


Table 1**Definition of Variables**

| Variable Name | Definition |
|---------------------------|--|
| Dependent Variable | |
| <i>Remedied</i> | <i>Remedied</i> is equal to 2 if it receives unqualified internal control opinions for two consecutive years (Fast remediator). <i>Remedied</i> is equal to 1 if it receives an adverse internal control opinion in the first year and an unqualified internal control opinion in the second year (Slow remediator). <i>Remedied</i> is equal to 0 if it receives adverse internal control opinions for two consecutive years (Non remediator). |

Firm-specific control variables

| | |
|-----------------|--|
| <i>Lnta</i> | The log of average total assets during the remediation period. |
| <i>Roa</i> | Net income divided by total assets. |
| <i>Distress</i> | Average financial distress during the remediation period. It is calculated as the cumulative distribution function of $-4.336 - 4.513ROA + 5.679FINL + 0.004LIQ$ (Zmijewski 1984, 69), where ROA is net income divided by total assets, FINL is total debt divided by total assets, and LIQ is current assets divided by current liabilities. Greater values of <i>Distress</i> indicate higher levels of distress presenting in the firm. |
| <i>Foreign</i> | An indicator variable that equals 1 if the firm reports any nonzero foreign currency adjustments during the remediation period, and 0 otherwise. |
| <i>Growth</i> | Percentage change in sales during the remediation period. |
| <i>Restruct</i> | An indicator variable that equals 1 if the firm reports any nonzero restructuring charges during the remediation period, and 0 otherwise. |

(Table 1 continued)

| | |
|----------------|--|
| <i>MA</i> | An indicator variable that equals 1 if the firm reports any mergers or acquisitions during the remediation period, and 0 otherwise |
| <i>Litigat</i> | An indicator variable that equals 1 if the firm operates in industries with SIC codes of 2833-2836 (biotechnology), 3570-3577 and 7370-7374 (computers), 3600-3674 |

(electronics), and 5200-6961 (retailing), and 0 otherwise.

Audit committee variables

| | |
|-----------------|---|
| <i>Expert</i> | Percentage of financial expertise in the audit committee |
| <i>Attend</i> | Percentage of members attending less than 75% meetings |
| <i>Direct</i> | Average number of outside directorships in other firms held |
| <i>CommSize</i> | Number of audit committee members |

Auditor-related variables

| | |
|--------------------|---|
| <i>Big 4</i> | A dummy variable that equals 1 if the company's auditor is one of the Big 4 audit firms and equals 0 for other auditors |
| <i>Auditfee</i> | Audit fees (in \$mil) |
| <i>Nonauditfee</i> | Non-audit fees (in \$mil) |
| <i>Initial</i> | A dummy variable that equals 1 if it is an initial engagement, and 0 otherwise |

Table 2**Sample Selection Results****Panel A: Sample Selection Procedure**

| Sample characteristics | Number of firms |
|--|-----------------|
| Total firms on Compustat (2005 to 2008): | 11,622 |
| Excluding firms receiving adverse opinions in the first year | (280) |
| Subtotal | 11,342 |
| Excluding firms not in RiskMetrics | (8,356) |
| Excluding firms not in AuditAnalytics | (19) |
| Excluding firms with missing data in RiskMetrics, AuditAnalytics and Compustat | (582) |
| Final sample | 2,385 |

Panel B: Distribution of Observations by Remedial Efficiency

| Remedial Efficiency | Initial Sample (%) | Final Sample (%) |
|------------------------------|--------------------|------------------|
| Fast remediator ^a | 10,662 (94%) | 2,111 (88.5%) |
| Slow remediator ^b | 451 (4%) | 218 (9.1%) |
| Non_remediator ^c | 229 (2%) | 56 (2.3%) |
| Total | 11,342 | 2,385 |

^a Receive unqualified internal control opinions for two consecutive years

^b Receive an adverse internal control opinion in the first year and an unqualified internal control opinion in the second year

^c Receive adverse internal control opinions for two consecutive years

Table 3
Descriptive statistics and univariate tests

| Variables | Mean of the independent variables | | | | T-test for differences in means | | |
|--|-----------------------------------|---------------|-----------------|------------------|---------------------------------|-------------------|-----------|
| | All (n=2385) | Non (n=56) | Slow (n=218) | Fast (n=2111) | F ^a -N ^b | S ^c -N | F-S |
| Firm-specific control variables | | | | | | | |
| <i>Lnta</i> | 7.86 | 7.16 | 7.38 | 7.93 | 3.70*** | 1.88* | 5.17*** |
| <i>Roa</i> | 0.14 | 0.13 | 0.06 | 0.14 | 1.29 | -9.16*** | 11.65*** |
| <i>Distress</i> | -3.56 | -2.33 | -2.38 | -3.71 | -9.46*** | -0.29 | -15.24*** |
| <i>Foreign</i> | 0.33 | 0.16 | 0.15 | 0.35 | 2.94*** | -0.25 | 6.11*** |
| <i>Growth</i> | 0.08 | 0.08 | 0.23 | 0.06 | -1.14 | 6.67*** | -10.93*** |
| <i>Restruct</i> | 0.40 | 0.16 | 0.20 | 0.42 | 3.96*** | 0.62 | 6.56*** |
| <i>MA</i> | 0.19 | 0.52 | 0.09 | 0.19 | -4.77*** | -6.15*** | 3.89*** |
| <i>Litigat</i> | 0.21 | 0.04 | 0.18 | 0.22 | 3.36*** | 2.71*** | 1.50 |
| Audit committee variables | | | | | | | |
| <i>Expert</i> | 0.45 | 0.82 | 0.28 | 0.45 | -9.02*** | -13.12*** | 8.42*** |
| <i>Attend</i> | 0.01 | 0.1 | 0.00 | 0.01 | -4.53*** | -4.88*** | 2.26** |
| <i>Direct</i> | 0.89 | 0.42 | 0.88 | 0.90 | 6.77*** | 9.79*** | 0.60 |
| <i>Commsize</i> | 3.85 | 3.27 | 3.72 | 3.88 | 4.37*** | 4.91*** | 2.19** |
| Auditors variables | | | | | | | |
| <i>Big4</i> | 0.94 | 0.27 | 0.94 | 0.95 | 11.45*** | 10.77*** | 1.17 |
| (Table 3 continued) | | | | | | | |
| <i>Initial</i> | 0.02 | 0.05 | 0.03 | 0.02 | -1.62 | -0.66 | -1.03 |
| <i>Auditfee</i> | 3.86 | 3.18 | 2.23 | 4.05 | 1.16 | -0.96 | 4.85*** |
| <i>Nonauditfee</i> | 0.94 | 0.43 | 0.18 | 1.03 | 1.75* | -2.49** | 4.92*** |

^aF indicates firms receiving unqualified internal control opinions for two consecutive years.

^bN indicates firms receiving adverse internal control opinions for two consecutive years.

^cS indicates firms receiving adverse internal control opinions in the first year and unqualified internal control opinions in the second year.

***, **, and * indicate significance at less than 1 percent, 5 percent, and 10 percent levels.

Table 4**Ordered logistic regression results for firms' timeliness in the remediation of MWs**

| | | Model 1 | Model 2 | Model 3 | Model 4 |
|--|---------------|-------------|-------------|-------------|-------------|
| Variable | Expected sign | Coefficient | Coefficient | Coefficient | Coefficient |
| Firm-specific control variables | | | | | |
| <i>Lnta</i> | + | 0.65*** | 0.55*** | 0.45*** | 0.39*** |
| <i>Roa</i> | + | 0.09 | 0.19 | 0.50 | 0.47 |
| <i>Distress</i> | - | -1.08*** | -1.10*** | -1.10*** | -1.12*** |
| <i>Foreign</i> | - | 0.18 | 0.20 | 0.22 | 0.19 |
| <i>Growth</i> | - | -1.67*** | -1.73*** | -2.49*** | -2.47*** |
| <i>Restruct</i> | - | 0.62*** | 0.56*** | 0.32 | 0.27 |
| <i>MA</i> | - | -0.33* | -0.11 | -0.17 | -0.01 |
| <i>Litigat</i> | + | 0.39* | 0.43* | 0.46* | 0.46* |
| Audit committee variables | | | | | |
| <i>Expert</i> | + | | 0.35 | | 0.52* |
| <i>Attend</i> | - | | -4.45*** | | -3.35*** |
| <i>Direct</i> | ? | | 0.18 | | 0.16 |
| <i>Commsize</i> | ? | | 0.36*** | | 0.29* |
| Audit firm-related variables | | | | | |
| <i>Big 4</i> | + | | | 2.43*** | 2.24*** |
| <i>Initial</i> | - | | | 0.42 | 0.36 |
| (Table 4 continued) | | | | | |
| <i>Auditfee</i> | ? | | | -0.17*** | -0.17*** |
| <i>Nonauditfee</i> | ? | | | 1.07*** | 1.09*** |
| Pseudo R-Square | | 19.1% | 20.2% | 23.8% | 24.4% |

***, **, and * indicate significance at less than 1 percent, 5 percent, and 10 percent levels.

Table 5**Binary logistic regression results for firms' timeliness in the remediation of MWs**

| | | Model 1 (F , N) | Model 2 (F , SN ^a) | Model 3 (FS ^b , N) |
|--|---------------|----------------------|------------------------------------|------------------------------------|
| Variable | Expected sign | Coefficient | Coefficient | Coefficient |
| Firm-specific control variables | | | | |
| <i>Lnta</i> | + | 0.36 | 0.42*** | 0.30 |
| <i>Roa</i> | + | -3.64 | 1.38 | -4.35* |
| <i>Distress</i> | - | -0.98*** | -1.07*** | -0.88*** |
| <i>Foreign</i> | - | -0.53 | 0.08 | -0.53 |
| <i>Growth</i> | - | 0.58 | -2.61*** | 0.80 |
| <i>Restruct</i> | - | 0.48 | 0.25 | 0.34 |
| <i>MA</i> | - | -0.98** | 0.25 | -1.11** |
| <i>Litigat</i> | + | 1.77** | 0.38 | 1.54* |
| Audit committee variables | | | | |
| <i>Expert</i> | + | -1.79** | 1.26*** | -2.01** |
| <i>Attend</i> | - | -3.04 | -2.12** | -3.26 |
| <i>Direct</i> | ? | 1.50** | 0.01 | 1.58** |
| <i>Commsize</i> | ? | -0.03 | 0.25** | -0.06 |
| Audit firm-related variables | | | | |
| <i>Big 4</i> | + | 3.13*** | 1.55*** | 3.16*** |
| (Table 5 continued) | | | | |
| <i>Initial</i> | - | -1.09 | 0.14 | -0.66 |
| <i>Auditfee</i> | ? | -0.13** | -0.17*** | -0.11*** |
| <i>Nonauditfee</i> | ? | 0.04 | 1.09*** | 0.02 |

| | | | |
|-----------------|-------|-------|-------|
| Pseudo R-Square | 13.3% | 23.2% | 12.2% |
|-----------------|-------|-------|-------|

^aSN indicates firms failing to receive unqualified internal control opinions in the first year.

^bFS indicates firms receiving unqualified internal control opinions in the second year.

***, **, and * indicate significance at less than 1 percent, 5 percent, and 10 percent levels.