Evidence from the U.S. on the Effect of Auditor Involvement in Assessing Internal Control over Financial Reporting

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Abstract

Securities regulators around the world are considering the costs and benefits of alternative policies for providing information to financial markets on corporate internal control. These policy options differ on the level of auditor involvement, among other dimensions. We examine the association of relative auditor involvement and auditor characteristics with Section 302 internal control disclosures made by US "non-accelerated filers" from 2003-2005. We find more material weaknesses disclosed in the fourth quarter, when there is relatively more auditor involvement, relative to the first three quarters. Clients of larger audit firms have higher disclosure rates (although they are likely less risky due to more stringent client acceptance standards), but this difference is due to fourth quarter disclosures. Audit firms with Section 404 experience also have greater material weakness disclosure, implying process improvement associated with knowledge sharing across engagements. Collectively, our results shed light on ways to increase the effectiveness of internal control regulation.

Keywords: Internal Controls, Sarbanes-Oxley, Section 302, Non-accelerated filers, Auditor Quality

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1. Introduction

The purpose of this paper is to assess the role of relative auditor involvement and auditor characteristics in disclosures of material weaknesses (MW) in internal controls related to the financial reporting process among U.S. companies, made pursuant to Section 302 of the Sarbanes-Oxley Act of 2002 (SOX). Concern regarding the quality of corporate financial information has prompted regulators around the world to consider policies designed to disclose the status of internal controls over financial reporting (ICFR) for listed companies. These disclosures both warn investors of potential risks, and encourage companies to improve controls in order to avoid disclosure. The extent of current enacted international regulations varies from merely recommending management communication on internal controls, to intermediate options (such as the "comply-or-explain" principle with no required controls testing in the Netherlands), to the extensive and costly management and auditor testing requirements in SOX Section 404 in the U.S. and "J-SOX" in Japan. Thus, a broad array of policy options exists, and because regulators continue to assess these options, further research on factors affecting MW disclosure is warranted.[1]

In this debate, a key issue is whether external auditor testing of controls is necessary for an effective process, as evidence from the U.S. indicates considerable increases in audit fees associated with mandated Section 404 auditor testing (e.g., Raghunandan and Rama 2006; Hoitash et al. 2008). To the extent that company management can be influenced by shareholders and corporate governance to disclose existing control flaws and improve their controls, then extensive auditor involvement in the process may be less necessary. Because policy choices cannot be directly compared within given jurisdictions, assessment of the incremental effect of auditor involvement in internal control regulations is difficult. However, data from SOX Section 302 reports in the U.S. (in effect since 2003) provide some evidence in this regard. Section 302 requires all U.S. public companies to document their internal controls over financial statement

[1] For example, a discussion paper of the Fédération des Experts Comptables Européens (FEE 2005) calls for a waiting period before further regulatory changes are enacted, during which evidence will be sought in order to inform their future deliberations.

disclosures and to assert the effectiveness of those controls in their quarterly reports to the SEC.[2] In contrast, SOX Section 404 (in effect since 2004) requires only the largest companies ("accelerated filers"[3]) to document and test ICFR, and assert in annual reports to the SEC whether or not ICFR are effective or ineffective. Section 404 also requires external auditors to test ICFR effectiveness and present an independent opinion. Thus, Section 302 is more similar to regulations of other countries, in that reliance is placed on company management to perform controls assessment, without the independent auditor testing of controls that is one important driver of Section 404's high compliance cost.

This paper provides evidence on the effectiveness of the internal control reporting process without mandatory auditor testing, by analyzing patterns of Section 302 disclosures over time and across quarterly reporting periods. We perform this analysis using only "non-accelerated filer" companies not required to file Section 404 reports, as after 2004 the audits of accelerated filers became fundamentally different (i.e., the financial statement and internal control audits of accelerated filers are now integrated). Our analysis is based on the assumption that higher MW disclosure rates indicate a more effective process.[4] Under this assumption, the increase in Section 302 MW disclosure rates since its implementation implies that the process has become more effective in detecting/disclosing internal control MW. But to what extent are increased disclosures associated with company managements becoming more effective at detecting and reporting their internal control weaknesses, and to what extent are they associated with auditor characteristics and activity? We address this question by testing three research hypotheses. Our first hypothesis predicts that fourth quarter MW disclosures will be more frequent than disclosures in other quarters, based on the following logic. Since Section 302 requires management to certify internal controls every quarter, effective management monitoring

[2] Technically, SOX 302 concerns "disclosure controls", i.e. controls over company activities in preparing reports to the SEC. While this concept is broader than "internal controls over financial reporting" (ICFR), the underlying concept of SOX 404, differences in practice are few. To investigate the similarity of these concepts in our sample, we examined all filings of sample companies that *Audit Analytics* coded as a MW. In all cases, these companies had at least one MW that directly relates to financial reporting. Thus, we conclude that the distinction between disclosure controls and ICFR is not meaningful for our sample, and hereafter use "ICFR" as the term to describe the nature of the controls covered by both provisions.

[3] Securities and Exchange Commission (SEC) guidelines define "accelerated filers" as companies which have at least $75 million of common equity float as of the end of the second quarter of the fiscal year, have previously filed at least one annual report with the SEC, and do not qualify as a small business under SEC rules.

[4] For instance, we assume that increasing MW disclosures over the 2003-2005 period indicate that more ICFR problems in subject companies are being discovered, not that controls in those companies are getting worse. Due to the pressures on U.S. companies to improve their controls, and the criminal penalties applied to corporate executives making false disclosures under Section 302, we believe this is a reasonable assumption.

should produce a similar distribution of MW disclosures across all four quarters of the year. However, there is relatively greater auditor involvement with the client's internal controls when performing the annual audit, relative to quarterly reviews (even though auditors are not required to document or test controls under Section 302). Thus, disproportionate MW disclosure in the fourth quarter implies that greater auditor involvement is needed for process effectiveness.

Second, we use a series of logistic regression models to investigate the effects of audit firm size and Section 404 experience on Section 302 disclosure rates among non-accelerated filers.[5] Our second hypothesis is that larger audit firms are associated with higher Section 302 disclosure rates among non-accelerated filers. We examine this issue both in terms of size tier (large, mid-tier, and "micro" audit firms with fewer than 20 public clients) and a continuous measure based on number of clients. Controlling for audit firm size and client characteristics, we test our third hypothesis, which predicts that Section 302 MW disclosures are affected by the external auditor's experience with Section 404. We expect that knowledge of internal controls is gained by engagement team personnel in the required documentation and testing process under Section 404. If that knowledge is shared with other personnel in the office and/or the firm, we expect higher rates of MW disclosure among clients of offices/firms with Section 404 experience. We test the effects of Section 404 experience at the office level for the pooled sample, and also at the firm level among clients of micro-audit firms. This analysis is important when considering whether current Section 302 disclosure rates might be experienced if a similar regulation were applied in other countries, as audit firms in those countries would not have Section 404 experience (except to the extent that relevant knowledge is effectively shared by global auditing networks).

Our sample comprises a three-year panel (2003-2005) of 2,206 non-accelerated filer companies with complete data on our variables of interest. Descriptive statistics show that MW disclosures were very low in 2003, but have substantially risen among these companies, implying that previously undetected control flaws were later discovered.[6] However, Section 302 disclosure rates are still lower by 2005 than Section 404 MW disclosures among accelerated filers (measured outside of the current paper's sample). Descriptive statistics show that increases

[5] Prior studies use a similar method (Ashbaugh-Skaife et al., 2007a; Doyle et al., 2007b), but do not focus solely on non-accelerated filers or the evolving nature of ICFR disclosures over time.

[6] Current regulations require auditor involvement with Section 404 compliance for non-accelerated filers to begin on 12/15/09. There has been considerable pressure from the business community against extending Section 404 to these smaller companies, and the deadline date has been extended several times.

in Section 302 MW disclosure have predominately occurred in the fourth quarter. This pattern supports H1, and implies that greater auditor involvement results in disclosure of MW that management has not previously detected.[7] Separately analyzing Q4 disclosures and Q1-Q3 disclosures using logistic regression models, we find that Q4 disclosures significantly increase from the 2003 baseline in both 2004 and 2005, while Q1-Q3 disclosures do not significantly increase until 2005. This suggests a lag in process improvement in Q1-Q3, when the process is more driven by management.

Testing H2, we find significantly higher rates of MW disclosure among clients of audit firms larger than the "micro" level. This effect is seen even though public clients of larger audit firms may have better underlying internal control quality, as since SOX, larger firms have been removing riskier clients from their portfolios (e.g., Cassell et al. 2007). Controlling for audit firm size, we also find support for H3. MW disclosure rates for both Q4 and Q1-Q3 are higher among clients of offices from which Section 404 engagements are also managed, suggesting that Section 404 engagements create knowledge that increases the frequency of disclosure in non-Section 404 engagements. Because smaller audit firms are less likely to have common training, formalized procedures for public clients, and knowledge management networks, we also estimate our models among clients of "micro" audit firms only. In this sub-sample, we find that office (and audit firm) Section 404 experience is significantly associated with greater MW disclosure, but this result is driven by the Q4 disclosures, when there is greater auditor involvement.

The above results suggest that offices/firms with Section 404 experience may use a different audit approach than those without such experience. If that approach involves more extensive testing or greater use of higher-level audit personnel, we should observe increased audit fees. To examine this possibility, we also estimate the association of Section 404 experience with audit fees in the pooled sample and the micro-audit firm sub-sample, controlling for client characteristics. In the micro-audit firm sub-sample, audit fees are higher among clients of audit offices or firms with Section 404 experience, suggesting audit quality differentiation among those firms on the basis of extent of testing and/or personnel assignment.[8] However, pooled sample results imply that fees are not higher for clients of offices of larger firms that have Section 404 experience (although fees are generally higher for all clients of these firms). Thus,

[7] The importance of auditor involvement is echoed in results of an archival study by Bedard and Graham (2008), who find that 84 percent of Section 404 MW are initially detected by auditor testing.

increased Section 302 disclosure rates among clients of offices of larger firms with Section 404 experience are likely not due to differences in audit procedures, but could rather result from differences in personnel knowledge of the implications of control testing and in the way evidence is evaluated.

The remainder of this paper proceeds as follows. In section 2, we review the current status of regulation on internal control in the US and in other major financial markets and discuss prior literature, leading to our hypotheses. Section 3 provides information on our research methods, while section 4 presents our results. In the concluding section, we discuss the limitations of our methods, and the implications of our findings for research and for evaluating ICFR regulatory alternatives.

2. Hypothesis Development

Background

The internal control provisions of SOX were intended to improve public confidence in the US financial markets following the accounting scandals of the early 2000's (e.g., Enron and WorldCom). Yet, evidence from other countries shows that these scandals transcend national boundaries (e.g., Parmalat in Italy, Royal Dutch Shell in Holland, Vivendi in France, and One.Tel in Australia). Research conducted during the 1990's on US companies (e.g., Elder and Allen, 2003; Geiger et al., 2006) suggests a reduction in audit testing and a decline in risk responsiveness in audit engagements leading up to that period, which may have contributed to declining earnings quality. As previously noted, two provisions of SOX relate to internal controls. Section 404 is currently limited to accelerated filers, while Section 302 applies to all public companies. This bifurcation of policy implies reliance on the Section 302 process to warn the investing public about weak ICFR among smaller companies. There are several differences between provisions of Sections 302 and 404 that affect both their costs and possible effectiveness. Under Section 404, managements of publicly traded companies must establish, document and test ICFR effectiveness. Auditors independently test ICFR and present an opinion on management's assessment and ICFR effectiveness. Under Section 302, management must document ICFR and publicly report on overall effectiveness of disclosure controls as well as specific ICFR weaknesses. While management must document internal controls under Section 302, neither management nor auditor must test controls. Thus, costs of compliance with Section 404 are considerably higher than those associated with regulations without required testing,

leading to concern that companies may delist their securities from U.S. markets (e.g., Engel et al. 2007; Piotroski and Srinivasan, 2008) or "go dark" by deregistering their securities (e.g., Leuz et al., 2008) to avoid Section 404 and other SOX requirements.

While compliance costs are high, some evidence of improvement since the enactment of SOX is becoming available in the literature. For instance, SOX's emphasis on internal control and financial reporting quality is likely associated with an increase in voluntary disclosures of information security issues after passage of the Act (Gordon et al., 2006).[9] Further, studies find benefits associated with "clean" internal control reports, including higher quality earnings (Bédard, 2006; Doyle et al., 2007a; Ashbaugh-Skaife et al., 2007a), lower cost of capital (Ashbaugh-Skaife et al., 2007b), and lower audit fees relative to companies with reported MW (Bedard et al., 2008b; Hoitash et al., 2008; Raghunandan and Rama, 2006).[10]

Around the world, internal control regulation varies substantially. According to a review performed by the Fédération des Experts Comptables Européens (FEE, 2005), auditors in EU member nations are required to produce external reports on internal control to shareholders only in Cyprus, France, Ireland, Sweden, and the UK. For the most part, these reports involve reviewing of the assessment by management/board, with no mandated testing by either party. For instance, in 1999 the "Turnbull Guidance" was published in the UK, a principles-based process for control evaluation which was later updated by the Financial Reporting Council (FRC, 2005). The key principle in this guidance is that corporate boards should maintain a sound system of internal control to safeguard the investment of shareholders. This standard requires the board of each company to review the effectiveness of the controls annually, and report to shareholders about their effectiveness and the evaluation process. While auditors are required to review whether company disclosures are supported by documentation, they are not required to provide control assurance. In Canada, the Canadian Securities Administrators (CSA) scaled back an earlier decision and decided against implementing a Section 404-equivalent regulation (MI 52-111) by opting for a process similar to Section 302. Australian regulators and the Australian Securities Exchange (ASX) were mindful of SOX when they introduced the Corporate Law Economic Reform Program (CLERP 9, which amended the Corporations Act of 2001) and

[9] Gordon et al. (2006) also show that the increase in voluntary disclosure of information security activities is greater among larger companies. This could coincide with steps taken by larger companies to comply with Section 404

[10] This possibility has recently prompted U.S. regulators to launch a study of the cost and benefits of Section 404 with specific attention to smaller companies (SEC, 2007).

revised the ASX governance guidelines. While some provisions of CLERP 9 are similar to SOX, CLERP 9 does not require auditors to opine on internal controls.[11] Japanese legislators approved an exchange law (familiarly known as "J-SOX") requiring annual management assessment of control effectiveness, with subsequent auditor evaluation leading to an opinion on management's assessment. Thus, with the exception of Japan, countries other than the U.S. have adopted internal control regulations that are more similar to Section 302 than Section 404. The costs and potential benefits of various regulatory alternatives may vary highly (e.g., Tafara, 2006). Policies requiring internal control testing could lead to pressure from the business community regarding high compliance cost, and the potential for decline in equity listings. In contrast, policies that are less costly, but also less effective, could lead to corporate failures that might devastate local economies.[12] Despite the importance of this policy choice, there is little empirical evidence to support it.

Research Hypotheses

This paper analyzes several issues around the general question of auditor influence on outcomes of the Section 302 MW disclosure process. First, we study the impact of relative auditor involvement by separating MW disclosures under Section 302 by quarter. While Section 302 places equal responsibility on company management in each quarter, external auditor involvement with the internal controls should be more pronounced during the fourth quarter, when the auditor performs procedures necessary for the financial statement audit. At this time, auditors are more likely to be involved in evaluating the client's control environment, and in testing controls if they are planning to rely on them. Substantive tests may also reveal internal control weaknesses. Thus, external auditors are likely to uncover some ICFR weaknesses even though they may choose to test not all controls over the financial reporting/disclosure process. Although auditors may discover weaknesses in ICFR during Q1-Q3 reviews, and client management may discover weaknesses in Q4, independent of external auditor activities, the

[11] The issue of quality of financial reporting for listed companies (including internal control over that function) is normally in the province of securities regulation, not auditing standards. Auditing standard-setters are reluctant to create different standards for listed and non-listed companies, thinking that (according to one former member of the IAASB) "An audit is an audit." However, this former IAASB member notes that the Board is watching with interest the events in the US, and seeks data on outcomes of US policy choices in order to inform their future deliberations. A similar stance was expressed by FEE (2005).

[12] The recent failure of controls over trading limits at Société Générale SA (e.g., Larsen and Hughes 2008) highlights the impact that control failure can have on an individual company. If the entity is among the largest in its sector (as is the case for this bank), then the effects of a single company's control failure may be felt industry-wide.

identification of MW in these periods provides a rough indicator of the effect of relative auditor involvement that is not otherwise available.[13]

While academic research has not addressed quarterly patterns in Section 302 reporting, the Lord & Benoit Report (2006) shows that most accelerated filers reporting a Section 404 MW early in its implementation period did not previously disclose a MW under Section 302. This suggests that auditor involvement in internal control documentation and testing may have helped to improve its effectiveness. However, the Lord & Benoit Report does not test this assertion outside of the Section 404 environment.[14] Our first hypothesis is:

> H1: Section 302 MW disclosure rates will be higher in the fourth quarter than in other quarters.

The second issue that we consider is the association between the size of the company's audit firm and the likelihood of MW disclosure. When Section 404 was implemented in late 2004, all large firms implemented procedures to promote compliance with the new regulation, and developed extensive training programs for their professionals. While some smaller firms may receive training and materials as part of affiliated networks, very small firms are less likely to have resources to devote to training materials, research, decision aids, and other means of helping their personnel meet this significant challenge within a relatively short period of time. Thus, it is likely that disclosure rates among smaller firms will lag those of larger firms. Supporting this assertion, Ashbaugh-Skaife et al. (2007a) find that clients of the six largest audit firms have higher disclosure rates in a combined sample of accelerated and non-accelerated filers in 2003-2004. However, because their sample includes accelerated filers, it does not directly address our research purpose.[15]

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[13] Auditors may discuss internal control issues with their clients during the first three quarters of the year. However, anecdotal evidence from audit practice (O'Sullivan, 2008) shows that auditors provide less systems advice to their clients following the independence regulations of SOX.

[14] While providing some evidence relevant to the current study, the Lord & Benoit report concerns accelerated filers in the transition from Section 302 to 404 reporting. Thus, it does not address auditor involvement in a regime where internal control testing is not required. Further, caution should be exercised in generalizing Section 302 disclosure rates among accelerated filers in 2004 to those of non-accelerated filers. In 2004, the SEC granted relief from Section 302 reporting for accelerated filers that were preparing their first Section 404 report (SEC, 2004), as noted in the staff's response to Question 9 of the Frequently Asked Questions (SEC 2004): "We would not object if a registrant did not disclose changes made in preparation for the registrant's first management report on internal control over financial reporting…." Therefore, Section 302 disclosure rates of accelerated filers could understate the extent of problems found in 2004, especially in the third and fourth quarters.

[15] Further, the sample period of Ashbaugh et al. (2007a) includes the period leading up to the first Section 404 reports, in which the SEC allowed relief from Section 302 disclosure for accelerated filers (see also footnote 14). Because our sample includes only non-accelerated filers, it is not subject to this issue.

Prior research examines the association between audit firm size and audit quality (or earnings quality) in other contexts. For example, DeAngelo 1981 contends that auditor size is a good proxy for audit quality. Subsequently, a number of studies examine financial statement outcomes and find evidence that larger audit firms often produce higher quality audits (see Francis 2004 for a review of this literature). While few studies examine auditor size at the level of the individual office, Choi et al. (2007) find that larger offices have both higher earnings quality (i.e., lower discretionary accruals) and audit fees, after controlling for national-level audit firm size and office-level industry expertise. However, as noted by Leone (2007) and others, the issue of endogeneity arises in interpreting the results of these studies, as clients with certain characteristics are likely to select audit firms in certain size tiers. Also, selection occurs from the audit firm side as well, as prior research shows that larger firms are likely to remove riskier clients from their client portfolios, or decline to accept them (e.g., Johnstone and Bedard 2004). Thus, client portfolios of larger audit firms should be composed of better quality clients even prior to any audit activity. In this paper, we predict *higher* MW disclosure rates among clients of larger firms. Thus, any tendency for client portfolios of larger firms to be of higher quality would bias against finding in favor of this hypothesis. Our second hypothesis is:

> H2: Section 302 MW disclosure rates will be higher among clients of large and mid-tier audit firms, relative to micro-audit firms.

Our third hypothesis concerns the association between Section 404 experience and the likelihood of Section 302 disclosures. Prior studies of audit firm experience have concentrated on industry specialization, testing whether firms that have higher concentrations of clients in particular industries perform better audits, are associated with higher financial reporting quality, and/or attract higher compensation in the form of audit fees. For example, Krishnan (2003) observes that clients of industry specialists have lower discretionary accruals, Carcello and Nagy (2002) find that clients of industry specialists are less likely to be involved in SEC enforcement actions, and Balsam et al. (2003) find higher earnings quality (with respect to discretionary accruals and earnings response coefficients) among clients of industry specialists. Other recent research extends this question to the level of the individual audit firm office. Ferguson et al. (2003) show that market perceptions and pricing of industry expertise in Australia are primarily based on office-level industry leadership in city-specific audit markets. Also, Francis et al.

(2006) find that office-specific expertise dominates national measures of industry expertise in explaining differential audit quality among the Big 5 firms.

Consistent with the above findings, we expect that auditors with Section 404 experience should gain knowledge of internal control through practice with Section 404 procedures. This expectation is based on articles in the auditing research and practice literatures, which indicate that prior to implementation of SOX Section 404, auditors often relied on substantive testing for audit evidence. As noted by Curtis et al. (2009), "…to the extent that the auditor could audit "around the controls" and gain assurance from substantive tests (i.e., tests of account balances and transaction amounts), many auditors had limited experience documenting and testing internal controls." Briggs (2008) notes that while SAS No. 94 was intended to address the gap in auditors' understanding of information technology and its role in internal control, this understanding was "sorely lacking" in audit engagements before SOX Section 404 brought effective enforcement to the process. Thus, it is likely that performing Section 404 audits brought about a relatively greater emphasis on internal control among those engagement teams. Sharing of knowledge on control documentation and testing obtained through practice and work on Section 404 could be accomplished in a number of ways. For instance, if the engagement partner or staff on Section 404 engagements are also part of engagement teams of non-accelerated filers informal exchanges of knowledge on ICFR could occur as engagement teams interact while performing audits of those smaller public companies. Furthermore, audit firms or specific offices could use more formal means of knowledge sharing, such as decision aids and training materials, to facilitate the dissemination of knowledge obtained through practice in control documentation and testing under Section 404.

The above discussion implies that auditors with Section 404 expertise should be more likely to detect existing internal control problems during the financial statement audit. Further, they may be more likely to convince clients to disclose problems detected at any point in the year, should they become aware of them. Hence, we expect a positive association between Section 404 experience and MW disclosure. Because all large audit firms have Section 404 clients, we are able to distinguish the effects of firm-level experience for only the smallest firms. Thus, our main test of this hypothesis is at the office level. We also use a firm-level Section 404 experience measure in the micro-audit firm sub-sample, where there is more variability in Section 404 engagement experience. Formally stated, our third hypothesis is:

H3: Section 302 MW disclosure rates will be higher among clients of audit firm offices with Section 404 experience.

3. Data and Method

We study these issues using data derived from quarterly Section 302 reports of non-accelerated filers during fiscal years 2003-2005. We obtain Section 302 disclosures and auditor-related data from *AuditAnalytics*, segment data from *Compustat* Segment files, merger data from *SDC Platinum* and financial data from *Compustat*. After removing companies with missing data, our sample comprises 9,881 firm-years for non-accelerated filers across the study period.[16] From these observations, we form a panel of companies with complete data for all three years, in order to avoid variability in client composition across years. This step results in a three-year panel of 2,206 companies (6,618 firm-years).

To test H1, we compare univariate statistics on MW disclosure by quarter. We test the remaining hypotheses using logistic regression models with three dependent variables. First, *MW302* equals one if a company reports at least one MW in its quarterly Section 302 reports; zero otherwise.[17] Second, we separately model those disclosures with greater auditor involvement in the Section 302 disclosure process with the dependent variable *Q4_MW*, which equals one if a company first discloses a MW in the fourth quarter and does not disclose a MW in the preceding three quarters; zero otherwise. Correspondingly, *Q1-Q3_MW* (proxying for MWs disclosed with relatively less auditor involvement) equals one if a company first discloses a MW in Q1-Q3 and does not disclose a MW in the fourth quarter of the preceding year; zero otherwise.[18]

To test H2 (the association between audit firm size and MW disclosure), we partition firms into three mutually exclusive groups: *LARGEFIRM* for the largest six audit firms (consistent with Ashbaugh-Skaife et al. 2007)[19]; *MID-TIER* for firms with 20 clients or more

[16] We define a company to be an accelerated filer if it filed at least one Section 404 report in 2004 or 2005.

[17] Section 302 requires companies to evaluate and publicly report on effectiveness of disclosure controls overall, as well as specific MWs in ICFR. Some companies report ineffective disclosure controls while disclosing no specific MWs. Our results not sensitive to giving those companies a value of one for the dependent variable, in addition to those companies reporting specific MW.

[18] Because some companies disclose MW in consecutive periods, in 95 cases we had to trace the first MW disclosure and attribute its initial appearance either to Q1-Q3 or Q4. In 80 of these cases the MW first appeared in Q4, and in 15 cases the MW first appeared in Q1-Q3. When estimating the model of *Q4_MW (Q1-Q3_MW)* we omit the MWs first disclosed in Q1-Q3 (Q4).

[19] The largest six audit firms are PricewaterhouseCoopers, Deloitte & Touche, Ernst & Young, KPMG, Grant Thornton and BDO Seidman.

(and not among the largest six) and *MICRO* for firms with fewer than 20 clients.[20] To test H3 (regarding the auditor's Section 404 experience), we construct two indicator variables, representing office-level and firm-level experience, respectively. To measure office-level experience, we first identify unique firm offices by examining the combinations of audit firm cities and states associated with each engagement in the *Audit Analytics* data file. The variable *404EXPERIENCE_OFFICE* equals one if a company is audited by an audit firm office that has/had at least one client filing a Section 404 report during the corresponding or prior fiscal year; zero otherwise.[21] To test effects of firm-level experience in the micro-audit firm sub-sample, we construct an indicator variable *404EXPERIENCE_FIRM*, which equals one if a company is audited by an audit firm that has/had at least one client filing a Section 404 report during the corresponding or prior fiscal year; zero otherwise.[22] We also use a continuous measure of firm size: the natural log of the number of clients, *LN#CLIENTS.* To control for changes in MW disclosures over time during our sample period, we define two indicator variables, *YEAR2004* and *YEAR2005*, equaling one for fiscal year 2004 and 2005, respectively; zero otherwise. We do not predict signs on the year indicators, as both directions are possible ex ante. If a backlog of problems that existed were disclosed in the first year of compliance, then the signs on these variables will be negative. However, if increasing practice with Section 302 (and the approach of Section 404) resulted in improved reporting, their signs will be positive.

Additional control variables are drawn from the MW determinants literature (e.g. Ashbaugh-Skaife et al., 2007a; Doyle et al., 2007b; Zhang et al., 2007; Bedard et al. 2008a), and are formally defined in Table 1. We include *LOGMARKETCAP* (the natural logarithm of the company's market capitalization) to control for company size. We control for recent auditor changes with *AUDITORCHANGE* (an indicator variable equal to one for companies that change auditors from the previous year). We also control for client complexity by including *MERGER* (an indicator variable equal to one for companies with recent mergers), *EXTREMEGROWTH* (an

[20] We use our complete sample (21,038 observations) to calculate the number of clients for each audit firm. Subsequently, we construct the indicator variables separately for each year. Of the 6,618 firm years in our final sample 3,150, 777 and 2,691 are audited by large, mid-tier and micro audit firms respectively (due to auditor changes the number of clients in each auditor class category changes from one year to the next).

[21] The number of observations in our tabled results are slightly reduced due to the availability of auditor city and state data.

[22] Because Section 404 activity did not commence until 2004, none of the 2003 engagements have a value of one for the Section 404 experience variables. We checked the sensitivity of our results to estimating the models on 2004 and 2005 data only. Results of hypothesis tests are unchanged, except that *LARGEFIRM* (marginal in the tabled models 1A and 1C) becomes insignificant. Also, our results are not sensitive to defining *MICRO* as ten or fewer clients.

indicator variable equal to one for high growth companies), *FOREIGN* (an indicator variable equal to one for companies with foreign operations), and *SEGMENT* (the sum of reported business and geographic segments). We further control for client business risk by including *LOSS* (an indicator variable equal to one for companies with recent losses), and *LITIGATION* (an indicator variable equal to one for companies operating in high litigation industries). Consistent with prior research, we expect a positive sign on all control variables except *LOGMARKETCAP*.

Because we use a pooled sample with multiple observations across time for the same companies, we control for time-series dependence in the residuals using clustering on the firm identifier (e.g., Petersen 2008). We use Model 1 to test factors associated with the likelihood of MW disclosure in the pooled sample. Model 1A examines MW disclosure in any quarter. Model 1B examines MW disclosures in the first three quarters, while Model 1C examines MW disclosures in the fourth quarter, where auditor involvement is relatively greater.

Model 1 (Pooled sample): $[302MW \text{ (Model 1A), } Q1\text{-}Q3\_MW \text{ (Model 1B), or } Q4\_MW \text{ (Model 1C)}] = \beta_0 + \beta_1 404EXPERIENCE\_OFFICE + \beta_2 LARGEFIRM + \beta_3 MID\text{-}TIER + \beta_4 YEAR2004 + \beta_5 YEAR2005 + \beta_6 AUDITORCHANGE + \beta_7 LOGMARKETCAP + \beta_8 LOSS + \beta_9 SEGMENT + \beta_{10} FOREIGN + \beta_{11} MERGER + \beta_{12} EXTREMEGROWTH + \beta_{13} LITIGATION + e$

We use Model 2 to test is used to test factors associated with the likelihood of MW disclosure in the Micro-audit firm sub-sample, similarly estimating overall disclosure in Model 2A, disclosure in the first three quarters in Model 2B, and disclosure in the fourth quarter in Model 2C.

Model 2 (Micro-auditor sample): $[302MW \text{ (Model 2A } Q1\text{-}Q3\_MW \text{ (Model 2B), or } Q4\_MW \text{ (Model 2C)}] = \beta_0 + \beta_1 404EXPERIENCE\_OFFICE + \beta_2 LN\#CLIENTS + \beta_3 YEAR2004 + \beta_4 YEAR2005 + \beta_5 AUDITORCHANGE + \beta_6 LOGMARKETCAP + \beta_7 LOSS + \beta_8 SEGMENT + \beta_9 FOREIGN + \beta_{10} MERGER + \beta_{11} EXTREMEGROWTH + \beta_{12} LITIGATION + e$

4. Results

Descriptive statistics and test of H1

Table 1 shows descriptive statistics for the pooled sample of 6,618 companies, and separately for clients of Large/Mid-Tier audit firms and Micro-audit firms, respectively. Prior to testing our hypotheses, we note that a fairly high proportion of non-accelerated filers (an average of 41% over our three-year sample) are audited by micro-audit firms, with fewer than 20 public clients. This proportion, and the concern expressed by the PCAOB Standing Advisory Group

(PCAOB 2004) about the relative costs and benefits of differential auditing standards for small firms, motivates separate analysis of this sub-sample. Univariate tests of differences shown in Table 1 between companies that do or do not disclose MW reveal higher proportions of *LOSS*, *MERGER* and *AUDITORCHANGE* among companies disclosing MW (statistics not tabled).

We test H1 in Table 2 Panel A, which shows the distribution of MW disclosures in Q1-Q3 versus Q4. The binomial test shows more Q4 disclosures in all three years (for 2003, p = 0.090; for 2004 and 2005, p = 0.000), indicating support for this hypothesis. (This is a conservative test, as it implies that the Q4 disclosure rate in each year is greater than that of the other three quarters combined.) The final column shows that overall, Section 302 MW annual disclosure rates increase across years in this panel of companies, from 35 (1.6 percent) in 2003, to 131 (5.9 percent) in 2004, to 229 (10.3 percent) in 2005. For comparison with Section 404 disclosure rates, we contrast these disclosure rates with Section 404 disclosures in a separate sample of smaller *accelerated* filers (i.e., those with less than the median of market capitalization among companies subject to Section 404; not tabled).[23] The rate of Section 404 MW disclosure among smaller accelerated filers is 20 percent in 2004, much higher than in our Section 302 sample. While in 2005, the Section 404 MW disclosure rate decreases to 14 percent for smaller accelerated filers, it still exceeds the Section 302 rate of 10.3 percent in the current paper's sample. These univariate statistics imply that the Section 302 process was not very effective in its early years, but is improving.[24]

Insert Tables 1 and 2 About Here

Panel B provides further detail on disclosure rates, showing the frequency of Section 302 MW disclosure by size of audit firm, quarter and year.[25] In parentheses, we present the percentage of MW disclosures within each auditor year size category (i.e., two disclosures among 861 micro-auditor clients in 2003 yields a 0.23% disclosure rate). Univariate comparisons show Q4 MW disclosure rates are higher within all audit firm size tiers and in all years, relative to Q1-Q3 disclosure rates. Panel B also shows that Q4 disclosure rates from 2003 to 2004 increase among clients in all three audit firm size classes. From 2004 to 2005, Q4 disclosure

[25] For efficiency of presentation, we do not table results of statistical tests in Panel B. The frequency of MW disclosures in Q1-Q3 in panel B is 177. However if we add all MW disclosures during the first three quarters as opposed to restricting the Q1-Q3 disclosures in each fiscal year to one this frequency increases to 188 . Our results for both panels are similar across both disclosure frequencies.

rates among micro-audit firms again increase ($p < 0.05$), while those of mid-tier and large firms level off. Considering Q1-Q3 disclosures, there are no differences in any size class from 2003 to 2004, but disclosure rates increase from 2004 to 2005 in all three size classes. While the Q1-Q3 rate increases in 2005, the rate of increase is lower than the Q4 rate. This suggests that improvement in management's Section 302 processes in quarters with less auditor involvement (i.e., when financial reports are reviewed but not audited) lagged improvement in Q4, when auditor involvement is relatively greater.

Comparing across audit firm size tiers within years, we find that the Q4 disclosure rate for micro-audit firm clients is significantly lower than among clients of large firms in 2003 ($p < 0.01$). In 2004, the Q4 disclosure rate among micro-audit firm clients is significantly lower than the disclosure rates of clients of both large and mid-tier audit firms ($p < 0.01$), while in 2005, the disclosure rates of micro-audit firms is lower than that of mid-tier firms ($p < 0.01$). These statistics imply that Section 302 processes around the annual audit were generally less effective for very small audit firms during our study period. In contrast, Q1-Q3 disclosure rates among micro-audit firms are not different from mid-tier and large firms in any year of the study period, at conventional levels. Overall, these patterns of disclosure rates provide some evidence of the importance of auditor involvement and audit firm size tier in our analysis. However, they do not control for company characteristics that prior research (e.g., Ashbaugh-Skaife et al. 2007) finds significant in explaining Section 302 disclosure likelihood. In the next section we present results of our multivariate models.

Model results and tests of H2 and H3

Model 1 estimates the associations of audit firm size tier (H2), Section 404 experience (H3), year, and other control variables with Section 302 MW disclosures among the pooled sample of non-accelerated filers. Model 1A examines overall disclosures, while Models 1B and 1C examine Q1-Q3 and Q4 disclosures, respectively. Results are presented in Table 3. Results of estimating Model 1A (whose dependent variable equals one if a Section 302 MW was disclosed in any quarter) show that larger audit firms have higher MW disclosure likelihood, consistent with H2. *MID-TIER* and *LARGEFIRM* are associated with greater MW disclosure ($p < 0.01$ and

$p < 0.10$ respectively).[26] The latter result is consistent with Ashbaugh-Skaife et al. (2007a), but not with Zhang et al. (2007), who use a matched pair design and find no effect of audit firm size.

We further test H2 by separating MW disclosures in the first three quarters of the year (Model 1B) and in the fourth quarter (Model 1C). Results are shown in Table 3. We find that both *MID-TIER* and *LARGEFIRM* are positive and significant in Model 1C (Q4 disclosures; $p < 0.01$ and 0.10). In Model 1B (Q1-Q3 disclosures), only *MID-TIER* has a marginally significant coefficient. These results generally support H2, but suggest a greater effect of audit firm size on MW in Q4 when auditors are more involved, relative to Q1-Q3.

H3 predicts that clients audited by offices with Section 404 office experience are more likely to disclose Section 302 MW. Model 1 A results support H3, showing that Section 404 experience in the audit firm office is associated with greater Section 302 MW disclosure ($p<0.01$). Several control variables in Model 1A have significant coefficients. *YEAR2004* and *YEAR2005* are associated with greater MW disclosure (both at $p < 0.01$). Further, the coefficient of *YEAR2005* is greater than that of *YEAR2004* ($p < 0.01$, not tabled). This implies a significant increase in overall disclosure from 2004 to 2005, while controlling for auditor and company characteristics. Newly appointed auditors are associated with greater MW disclosure ($p < 0.01$), as found by prior research on companies not limited to non-accelerated filers (e.g., Ettredge et al. 2007). Regarding client characteristics, Model 1A shows that a net loss ($p < 0.01$) and greater complexity (recent mergers and more business segments, both $p < 0.01$) are associated with MW disclosure.

Insert Table 3 About Here

In Models 1B and 1C, we find support for H3, as the coefficients on the office experience variable are positive and significant ($p < 0.01$). These findings suggest that Section 404 experience is associated with a more rigorous audit process for non-accelerated filers in these offices; for example, in the collection or evaluation of audit evidence. Examining disclosure rates across time, Model 1B shows that only *YEAR2005* is significant ($p < 0.01$), while both year indicators are significant in Model 1C ($p < 0.01$). This suggests that while disclosure rates improve in Q4 of 2004, when auditor involvement is greater, another year passes before a

[26] When we remove Grant Thornton, and BDO Seidman from the *LARGEFIRM* group and include them instead in the *MID-TIER* group, *LARGEFIRM* becomes insignificant in all Table 3 models and *MID-TIER* becomes significant ($p < 0.10$) in model 1 B. We exclude the continuous measure for firm size (*LN#CLIENTS*) from Table 3 because high VIF values suggest multi-collinearity with the firm size tier indicators. All other VIF values are well below the 10.00 threshold suggested by Neter et al. (1996).

significant increase in disclosure occurs in Q1-Q3.[27] These results are intriguing, as they suggest that the improvement in MW disclosures under Section 302 was delayed during quarters with less auditor involvement in the process. In sum, Models 1B and 1C show progressively increasing Q4 disclosure rates across time, greater Q4 disclosure for clients of audit firms in the larger two size classes, and greater Q4 disclosure for clients of audit firm offices with Section 404 experience. When the auditor is presumably less involved in the Section 302 process (Q1-Q3), only Section 404 office experience and year 2005 are significant.

Supplemental analysis of micro-audit firms

We next investigate MW disclosure in the sub-sample of micro-audit firms (i.e., those with 20 or fewer public clients). Table 4 presents results of Model 2, investigating the effects of office-level Section 404 experience in this sub-sample. Model 2A, explaining MW disclosure over all four quarters, shows that audit firm Section 404 office experience is significantly associated with increased MW disclosure ($p < 0.05$), as it is in the pooled sample (Model 1A).[28] The Section 404 office experience variable is significant in Model 2C (Q4 MW disclosure; $p < 0.05$), but not in Model 2B (Q1-Q3 disclosure). In untabled models, we also test the effect of firm level Section 404 experience in the micro-auditor sub-sample. (As previously noted, there is variance in Section 404 experience at the firm level only among the micro-auditor group because virtually all large and mid-tier firms have at least one Section 404 client.) When we substitute firm-level Section 404 experience for office-level experience in Models 2B and 2C, results are identical: firm-level experience is significantly associated with greater MW disclosure only at Q4. Taken together with results in Table 3 (pooled sample), our findings in the micro-audit firm sub-sample suggest that knowledge sharing from Section 404 to Section 302 engagements occurs in all size firms at the annual audit. However, in the first three quarters (when auditors are less directly involved with the Section 302 reporting process), significant knowledge sharing from Section 404 activity occurs only among the larger firms. Table 4 also shows that among clients of micro-audit firms, larger companies are more likely to disclose MW in all three models, a

[27] Control variables have similar significance in Models (B) and (C), implying that client characteristics associated with disclosure do not differ by quarterly timing of the reports.

[28] Both *YEAR2004* and *YEAR2005* are significant in Model 2A, as they are in Model 1A. Control variables that are significant in Model 2A include *LOGMARKETCAP*, *LOSS*, *SEGMENT*, *EXTREMEGROWTH*, and *AUDITORCHANGE.* All are in the predicted direction except for market cap, which is positive. This implies that larger clients of micro-audit firms are more likely to have Section 302 MW disclosures.

result that is contrary to prior research (Ashbaugh-Skaife 2007a and Zhang et al. 2007). There are several possible explanations for this difference in the micro-audit firm sample. For example, the operating and reporting environment of smaller companies audited by these firms are less complex, and therefore these companies may have fewer underlying control problems to detect. Alternatively, the quality of underlying controls could be similar, but detection and disclosure rates differ. Managements of smaller companies audited by micro-audit firms could be less effective in detecting and disclosing their control problems, and those very small audit firms could be less effective in providing assistance to management in detection and disclosure than are larger audit firms.

Insert Table 4 About Here

Supplemental analysis of audit fees

As discussed above, higher rates of Section 302 disclosures associated with Section 404 experience suggest differences in the conduct of engagements by those offices. Evidence on differences in audit processes associated with Section 404 experience is not publicly available, limiting our ability to examine this more directly. However, we provide some additional analysis relevant to this issue by estimating models of the natural log of audit fees over the study period. This model tests whether audit fees are higher when audit offices have Section 404 experience. If audit quality differentiation among offices with Section 404 experience affects audit fees following Section 404 implementation, we should observe positive and significant coefficients on these variables. Control variables in the fee model (defined in Table 1) are drawn from the audit fee literature (e.g., Simunic, 1980; Simunic and Stein, 1986; Hay et al., 2006), including company size (the natural log of total assets), loss, number of business segments, foreign subsidiaries, recent merger activity, return on assets, recent restructuring, auditor change, litigation-prone industry, and new financing (i.e., recent equity offerings). Models 3A and 3B examine the association of Section 404 experience and control variables on the natural log of audit fees. Based on prior research, we expect positive signs for these control variables, with two exceptions. First, we expect a negative sign for return on assets. Second, we do not predict a sign for auditor change, as recent audit fee research based in the US shows inconsistent signs associated with auditor switches (e.g. Bedard et al, 2008b). The audit fee models are as follows:

Model 3A (Pooled sample): $lnFEE = \beta_0 + \beta_1 LARGEFIRM + \beta_2 MID\text{-}TIER + \beta_3 404EXPERIENCE\_OFFICE + \beta_4 YEAR2004 + \beta_5 YEAR2005 + \beta_6 MW302 + \beta_7 AUDITORCHANGE + \beta_8 lnASSETS + \beta_9 LOSS + \beta_{10} SEGMENT + \beta_{11} FOREIGN + \beta_{12}$

$MERGER + \beta_{13} ROA + \beta_{14} RESTRUCTURE + \beta_{15} NEW\_FIN + \beta_{16} INVREC + \beta_{17} LITIGATION + e$

Model 3B (Micro-auditor sample): $lnFEE = \beta_0 + \beta_1 404EXPERIENCE\_OFFICE + + \beta_2 YEAR2004 + \beta_3 YEAR2005 + \beta_4 MW302 + \beta_5 AUDITORCHANGE + \beta_6 lnASSETS + \beta_7 LOSS + \beta_8 SEGMENT + \beta_9 FOREIGN + \beta_{10} MERGER + \beta_{11} ROA + \beta_{12} RESTRUCTURE + \beta_{13} NEW\_FIN + \beta_{14} INVREC + \beta_{15} LITIGATION + e$

Table 5 shows the results of estimating these models. In Model 3A, we observe that clients audited by offices with Section 404 experience do not pay higher audit fees in comparison to others. This non-significant result in the pooled sample suggests the extent of engagement effort and the pricing of that effort do not vary according to whether or not an office has experience with Section 404 engagements. Yet Model 3B results show that in the micro-audit firm sub-sample, the office experience indicator is positive and significant ($p < 0.01$). Thus, the fee models show that engagements of offices with Section 404 experience are differentially priced among micro-audit firms, but not in larger firms.[29] Among micro-audit firms, the combination of increased Section 302 disclosure rates and a fee differential associated with Section 404 experience suggests that some aspect of the audit process that is measured in fees is different, likely due to knowledge spillover from Section 404 engagements. For example, this difference could take the form of greater engagement effort or a greater proportion of effort in higher-level personnel. However, in the pooled model, the combination of increased Section 302 disclosure rates and *no* fee differential associated with Section 404 experience suggests that for larger firms, the difference in process associated with knowledge sharing is not due to factors such as extent of effort or personnel mix, which should be observable in fees. Rather, the audit practices of larger firms are likely more standardized, and the Section 302 process improvement associated with experience in larger firms may result from better evaluation of audit evidence instead of different procedures.

In addition, both models 3A and 3B show that audit fees are higher for companies disclosing MW, as consistently found by prior research on Section 302 and Section 404 (Bedard et al., 2008b; Hoitash et al., 2008; Raghunandan and Rama, 2006). Also in both models, audit fees are higher overall in 2004 and 2005 than in the baseline year 2003 ($p<0.01$).[30]

[29] We continue to observe an insignificant association of Section 404 experience with audit fees when we estimate the model separately for clients audited by large and mid-tier auditors.

[30] A number of control variables in these models are significant, with directions consistent with prior audit fee research. One exception is that the coefficient on *INVREC* in Model 3A is negative and significant.

5. Summary and Limitations

This paper tests three hypotheses regarding the association of auditor involvement and characteristics with patterns of SOX Section 302 MW disclosures among non-accelerated filers. Our examination is motivated by differences in regulation regarding internal control over financial reporting, particularly in the extent of auditor involvement in the process. Specifically, we examine the role of relative auditor involvement, auditor size and auditor experience with control testing under Section 404. In the following paragraphs, we discuss the implications and limitations of our study.

As a baseline, we find an overall lower rate of MW disclosure under Section 302 for our sample, compared with companies in the smaller cohort of accelerated filers reporting under Section 404. While the annual rate of Section 302 MW disclosure increases from 2003-2005, it is still lower by 2005 than the MW disclosure rate observed in Section 404 reports among smaller accelerated filers. This suggests that, although undetected MWs remain among non-accelerated filers, some process improvement is evident. This result should be generalized to other countries with caution. The U.S. SEC has announced the intention to apply Section 404 to non-accelerated filers. While this action has been delayed, it is still SEC policy as this writing. The impending application of Section 404 to non-accelerated filers has likely increased their attention to the process of evaluating and improving internal controls over financial reporting. Thus, the process improvement that we observe in the 2003-2005 period for Section 302 reporting likely overstates the improvement that would be observed in other countries with an otherwise similar regulatory structure. Hence, based on currently available data, our evidence suggests that Section 302-type regulation alone falls short of motivating companies to invest in ICFR detection and/or to disclose detected problems.

With respect to the timing of reported MW, we observe a greater frequency of MW disclosure in periods with greater auditor involvement (i.e., Q4) in each year of our sample period. Further, disclosures associated with more auditor involvement significantly increased in 2004 and again in 2005. In contrast, improved disclosure in quarters with less auditor involvement (Q1-Q3) was delayed by a year. These results signal greater process effectiveness when auditors are more involved.

We also observe that larger audit firms are associated with greater MW disclosure frequency in comparison to small firms, although their clients are likely less risky. This evidence

suggests that auditors and audit quality play a significant role even without mandatory control testing. We further investigate whether experience with Section 404 engagements contributes to the likelihood of MW disclosure. As expected, we find that clients of audit firm offices with Section 404 experience are more likely to disclose MW. This could suggest that formal and informal knowledge sharing and staff experience further contribute to process effectiveness. Interestingly, among smaller auditors we find that office and firm experience with Section 404 are only associated with Q4 MW disclosures.

International regulators considering policy options without required auditor testing of ICFR effectiveness should consider steps to improve management and auditor processes under those regimes. Our findings of increased disclosure rates associated with auditor experience suggest that ICFR testing effectiveness might be improved through availability of training in procedures aimed at understanding and detecting internal control weaknesses. Along these lines, the PCAOB has announced an effort to educate smaller audit firms in the US (PCAOB 2006). Regarding the effectiveness of management's internal control assessments, our results show increasing disclosure rates in quarters where there is less auditor involvement, but a lag in the timing of this improvement. This delay is observed even in a system where public disclosure of control effectiveness (but not testing of controls) is mandatory. This suggests that international regulators should consider mandatory reporting of internal control problems to the public, even in the absence of required testing, as required disclosure should lead to greater management accountability.

Overall, our results point to an increase in MW disclosures under Section 302, especially in periods with greater audit involvement. Furthermore, we find evidence consistent with knowledge sharing, as clients of larger audit firms and offices with experience in controls testing have higher MW disclosure rates. We acknowledge that generalizing these results to other countries should be done with caution, due to variation in regulations. While noting this limitation, our results suggest that companies audited by small firms without direct experience with the US Section 404 process (or without an alternative means of gaining the knowledge derived from that experience) will have low disclosure rates, perhaps approximating the one percent level for US Section 302 disclosures observed in 2003. Thus, many ICFR weaknesses may remain undiscovered and unremediated. Eventually, future research will improve our understanding of policy choices through cross-national comparisons of fraud, restatements and

earnings quality over time, directly addressing the effects of various regulatory regimes on financial reporting quality.

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Table 1
Descriptive Statistics

	Pooled sample ***Mean (s.d.) or percent***		***Large Auditors*** ***Mean (s.d.) or percent***		***Mid Tier Auditors*** ***Mean (s.d.) or percent***		***Micro-Auditors*** ***Mean (s.d.) or percent***	
	No MW	***MW Disclosed***	***No MW***	***MW Disclosed***	***No MW***	***MW Disclosed***	***No MW***	***MW Disclosed***
N=	6,223	395	2,958	192	694	83	2,571	120
LN#CLIENTS	4.20 (2.64)	4.42 (2.28)	6.79*** (0.65)	6.57 (0.74)	3.49 * (0.40)	3.41 (0.34)	1.42 (0.91)	1.69 *** (0.81)
404EXPERIENCE_FIRM	69.4%	83.1%***	100.0%	100.0%	94.2%	97.5%	29.5%	48.2%***
404EXPERIENCE_OFFICE	53.2%	72.5%***	74.8%	84.3%***	70.7%	88.8%***	24.9%	43.9%***
LNMARKETCAP	3.57 (2.47)	3.61* (1.84)	4.78*** (2.57)	4.30 (1.92)	2.93 (1.52)	2.85 (1.65)	2.34 (1.78)	3.03*** (1.36)
LOSS	61.7%	77.0%***	53.7%	69.8%***	57.6%	78.3%***	71.9%	87.5%***
SEGMENT	5.65 (5.83)	5.15 (4.84)	7.66** (6.86)	6.68 (5.62)	3.66 (3.95)	3.34 (3.16)	3.88 (3.87)	3.96 (3.53)
FOREIGN	21.5%	24.8%	35.1%	38.5%	8.0%	13.3%	9.5%	10.8%
MERGER	8.5%	13.4%***	8.9%	12.5%*	7.0%	15.7%***	8.3%	13.3%**
EXTREMEGROWTH	18.5%	21.0%	15.9%	14.6%	14.7%	19.2%	22.5%	32.5%***
AUDITORCHANGE	15.2%	27.6%***	8.3%	18.8%***	21.0%	19.3%	21.6%	47.5%***
LITIGATION	20.9%	24.1%	24.5%	26.6%	17.9%	18.1%	17.6%	24.1%*

Notes: The table presents descriptive statistics on independent variables for the pooled sample and sub-samples separated by auditor size class. The following symbols indicate significant effects in two-tailed tests between companies that do or do not disclose a MW: * = < 0.10; ** = < 0.05; *** = < 0.01. The descriptive statistics for *404EXPERIENCE_FIRM* and *404EXPERIENCE_OFFICE* exclude data from 2003 because Section 404 reporting began in 2004.

Table 1 (continued)
Variables Definition

Variable	*Definition [source]*
404EXPERIENCE_FIRM	An indicator variable equal to one if the company's audit firm also audits at least one client that has filed a Section 404 report [Audit Analytics]
404EXPERIENCE_OFFICE	An indicator variable equal to one for companies audited by audit firm with 404 experience at the office level (i.e. The firm office audited at least one accelerated filer).[Audit Analytics]
MICRO	An indicator variable equal to one if the company is audited by an audit firm with fewer than 20 publicly traded clients [Audit Analytics]
MID-TIER	An indicator variable equal to one if the company is audited by an audit firm with 20 or more publicly traded clients, which is not among the largest six audit firms [Audit Analytics]
LARGEFIRM	An indicator variable equal to one if the company is audited by any of the largest six audit firms (PricewaterhouseCoopers, Deloitte & Touche, Ernst & Young, KPMG, Grant Thornton, and BDO Seidman).
LN#CLIENTS	The log of the number of publicly traded clients for each audit firm [Audit Analytics]
AUDITORCHANGE	An indicator variable equal to one if the company changed auditors; zero otherwise [Audit Analytics]
LOGMARKETCAP	The log of share price times the number of shares outstanding [Compustat data item #25 * Compustat data item #199]
lnASSETS	Natural logarithm of total assets [Compustat data item #6].
LOSS	An indicator variable equal to one if the company had net loss in any of the last two years; zero otherwise [Compustat data item #172]
SEGMENT	The sum of reported business and geographic segments in 2004 [Compustat Segment file]

Table 2
Material Weakness Disclosures by Quarter

Panel A. Test of H1: MW Disclosures by Quarter, Pooled Sample

	Quarter 4	*Quarter 1-3*	*Binomial Test Probability*	*Total*
2003	23	12	0.090	35
2004	110	21	0.000	131
2005	145	84	0.000	229
Total	278	117		395

Panel B. Supplemental Information on Number (Percent per Quarter) of Clients Disclosing MW, by Year and Audit Firm Size

	Micro-Auditors		***Mid-Tier Firms***		***Large Firms***	
	Q4	***Q1-3***	***Q4***	***Q1-3***	***Q4***	***Q1-3***
2003	2 (0.23%)	4 (0.15%)	2 (1.12%)	1 (0.19%)	19 (1.63%)	7 (0.20%)
2004	28 (3.21%)	3 (0.11%)	24 (8.69%)	4 (0.48%)	58 (5.49%)	14 (0.44%)
2005	50 (5.21%)	33 (1.15%)	34 (10.66%)	18 (1.88%)	61 (6.57%)	33 (1.19%)

Notes: Panel A compares MW disclosures by year in the overall sample. Panel B presents the number and percentage of MW disclosures by year and auditor size class.

Table 3
Logistic Regression of Determinants of Material Weakness Disclosures, Pooled Sample

		(1A) DV = MW302	***(1B) DV = Q1-Q3_MW***	***(1C) DV = Q4_MW***
	Predicted Sign			
INTERCEPT		-6.099 (328.72***)	-8.044 (148.8***)	-6.287 (268.17***)
LARGEFIRM (H2)	+	0.246 (2.06*)	0.110 (0.18)	0.299 (1.96*)
MID-TIER (H2)	+	0.771 (19.47***)	0.485 (3.31**)	0.899 (17.28***)
404EXPERIENCE_OFFICE (H3)	+	0.647 (18.4***)	1.067 (18***)	0.503 (7.91***)
YEAR2004	+/-	1.103 (32.6***)	0.147 (0.16)	1.406 (39.22***)
YEAR2005	+/-	1.826 (64.71***)	1.727 (17.62***)	1.843 (46.78***)
AUDITORCHANGE	+/-	0.785 (41.6***)	0.908 (18.07***)	0.732 (26.15***)
LOGMARKETCAP	-	0.047 (1.86)	0.043 (1.03)	0.045 (1.1)
LOSS	+	0.917 (37.31***)	1.172 (21.03***)	0.828 (21.28***)
SEGMENT	+	0.036 (5.87***)	0.053 (4.38**)	0.030 (3.08**)
FOREIGN	+	0.03 (0.03)	-0.485 (2.48*)	0.219 (1.44)
MERGER	+	0.472 (8.37***)	0.307 (0.98)	0.549 (9.17***)
EXTREMEGROWTH	+	0.134 (0.94)	0.241 (1.01)	0.097 (0.35)
LITIGATION	+	-0.112 (0.42)	-0.133 (0.23)	-0.111 (0.29)
Maximum rescaled R^2		0.148	0.161	0.123
Sample Size		6,588	6,310	6,471
# of Material weakness		395	117	278

Notes: The table presents coefficients (Wald Chi-square) for models estimating the likelihood of disclosing material weaknesses. *MW302* = 1 if the company reported a material weakness under 302. *Q1-Q3_MW* =1 for MW reported in Q1-Q3 (management-attributed discoveries) and *Q4_MW* = 1 for MW reported in Q4 (auditor-attributed discoveries); zero otherwise. *YEAR2004* = 1 for observations from fiscal 2004, and *YEAR2005* = 1 for observations from fiscal 2005; zero otherwise. Other variables are defined in Table 1. Indicator variables for industry membership (1-digit SIC) are included in the models but not tabled. In all tables, *** designates significance at the 1% level; ** significance at the 5% level; and * significance at the 10% level; one-tailed tests are used when coefficients have predicted signs.

Table 4
Logistic Regression of Determinants of Material Weakness Disclosures, Micro-Auditor Sample

		(2A) DV = MW302	***(2B) DV = Q1-Q3_MW***	***(2C) DV = Q4_MW***
	Predicted Sign			
INTERCEPT		-7.971 (110.93***)	-10.003 (57.8***)	-8.621 (63.44***)
404EXPERIENCE_OFFICE (H3)	+	0.475 (3.14**)	0.246 (0.45)	0.578 (2.91**)
LN#CLIENTS	+	0.077 (0.36)	0.287 (2.17*)	-0.008 (0.00)
YEAR2004	+/-	1.755 (13.83***)	-0.093 (0.01)	2.758 (13.19***)
YEAR2005	+/-	2.911 (32.16***)	2.599 (12.8***)	3.495 (17.74***)
AUDITORCHANGE	+/-	0.307 (19.59***)	0.272 (8.21***)	0.324 (12.68***)
LOGMARKETCAP	-	1.093 (35.25***)	1.040 (10.24***)	1.127 (27.77***)
LOSS	+	1.142 (12.58***)	1.668 (7.65***)	0.936 (5.94***)
SEGMENT	+	0.091 (11.7***)	0.096 (3.49**)	0.095 (10.04***)
FOREIGN	+	-0.539 (1.88*)	-1.048 (1.82*)	-0.373 (0.71)
MERGER	+	0.203 (0.48)	-0.147 (0.07)	0.325 (1.00)
EXTREMEGROWTH	+	0.321 (2.14*)	0.710 (4.49**)	0.148 (0.29)
LITIGATION	+	0.018 (0.00)	-0.276 (0.39)	0.164 (0.21)
Maximum rescaled R^2		0.224	0.239	0.209
Sample Size		2,665	2,585	2,625
# of Material weakness		120	40	80

Notes: The table presents coefficients (Wald Chi-square) for models estimating the likelihood of disclosing material weaknesses among "micro" audit firms (i.e., those with fewer than 20 clients. Variables are defined in Table 1 or Table 3. Indicator variables for industry membership (1-digit SIC) are included in the models but not tabled. Results of tests of Section 404 experience are similar when 404 experience is measured at the audit firm, rather than the office, level. Note that while the coefficient on *LOGMARKETCAP* is identified as significant, the sign of the coefficient is opposite to that predicted.

Table 5
OLS Regression of the Natural Log of Audit Fees

		(3A) ***Pooled sample***	*(3B)* ***Micro-auditor sample***
	Predicted Sign		
INTERCEPT		9.602 (223.69***)	9.783 (182.72***)
LARGEFIRM	+	0.521 (22.77***)	
MID-TIER	+	0.099 (3.44***)	
404EXPERIENCE_OFFICE	+	-0.031 (-1.24)	0.186 (5.22***)
YEAR2004	+	0.181 (6.97***)	0.122 (3.88***)
YEAR2005	+	0.359 (12.06***)	0.285 (7.84***)
MW302	+	0.343 (9.37***)	0.292 (4.62***)
AUDITORCHANGE	+/-	-0.037 (-1.46*)	0.007 (0.20)
lnASSETS	+	0.348 (54.99***)	0.218 (30.65***)
LOSS	+	0.185 (9.22***)	0.144 (4.52***)
SEGMENT	+	0.024 (11.52***)	0.034 (8.46***)
FOREIGN	+	0.141 (5.59***)	0.182 (3.95***)
MERGER	+	0.103 (3.53***)	0.155 (3.57***)
ROA	-	0.000 (-3.32***)	0.000 (-5.02***)
RESTRUCTURE	+	0.351 (11.19***)	0.357 (5.36***)
NEW_FIN	+	0.066 (2.98***)	0.046 (1.56*)
INVREC	+	-0.222 (-5.53***)	0.052 (0.97)
LITIGATION	+	-0.038 (-1.66**)	0.014 (0.41)
Adjusted R^2		0.765	0.502
Sample Size		6,477	2,571

Notes: The table presents coefficients (t statistics) for models estimating the natural log of audit fees, in the pooled sample and among clients of Micro-audit firms. Variables are defined in Table 1 or Table 3. Indicator variables for industry membership (1-digit SIC) are included in the models but not tabled.