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SOX 404, Auditor Effort, and the Prevention of Financial Report Misstatements

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SUMMARY: Prior research shows that the Sarbanes-Oxley Act (SOX) Section 404(b) integrated audit is associated with a lower incidence of misstatements. We predict that under 404(b), the auditor's ability to detect misstatements increases relative to other internal control regimes when greater resources are exerted during the engagement. Supporting this prediction, we find that the benefits of 404(b) versus other regimes (including SOX 404(a)) in reducing misstatements increase with incremental audit effort (proxied by abnormal audit fees). We find no benefit of 404(b) in misstatement reduction when abnormal audit effort is low. This implies that the value of 404(b) testing is not uniform, but rather is greater when sufficient resources are available to thoroughly understand client controls. In contrast, we find no benefit of abnormal audit effort under other regulatory regimes. We further examine the conditions under which knowledge gained from auditor internal control testing is more valuable. We find that the benefits of increased audit effort under 404(b) do not vary across internal control regimes under AS2 versus AS5, and are more pronounced for engagements with shorter auditor tenure, non-Big 4 auditors, and industry-specialist auditors.

Keywords: audit quality; internal controls; SOX 404(b); restatements; material weakness.

JEL Classifications: M49.

Data Availability: Data used in this study are available from public sources.

INTRODUCTION

We examine whether the effectiveness of Section 404(b) of the Sarbanes-Oxley Act (SOX, U.S. House of Representatives 2002) in reducing financial misstatements varies with auditor effort, and the circumstances under which greater audit effort enhances the benefits of 404(b) in misstatement prevention/detection. SOX contains many provisions intended to help restore investor confidence in corporate financial reporting. Among these is SOX 404, designed to improve the quality of financial reports by requiring evaluation by management (SOX 404(a)) and auditors (SOX 404(b)) of internal controls over financial reporting, as well as disclosure of control weaknesses that might allow material misstatements in the financial reports. As one of the most costly and controversial provisions of SOX, Section 404(b) had been the focus of a number of studies assessing its effectiveness.[1] Particularly relevant to our investigation, Nagy (2010) finds lower

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[1] Other financial reporting benefits have also been documented by Krishnan and Yu (2012), Chen, Krishnan, Sami, and Zhou (2013), and Holder, Karim, and Robin (2013). Research also documents considerable increases in compliance costs as a result of SOX 404(b) (Raghunandan and Rama 2006; Foster, Ornstein, and Shastri 2007; R. Hoitash, U. Hoitash, and Bedard 2008; Krishnan, Rama, and Zhang 2008).

misstatement likelihood for firms under SOX 404(b) in the year following implementation. While that study finds a market-wide effect, it is not clear whether control testing under 404(b) uniformly benefits all firms. This issue has important implications for investors in assessing reliability of financial reports, as well as for regulators in measuring benefits relative to costs of this key regulation.

Why might the benefits of SOX 404(b) testing not apply uniformly? One insight arises from research on the financial reporting quality benefit of incremental auditor effort. Prior research shows that greater engagement effort (surrogated by abnormal audit fees) is associated with the reduced likelihood of subsequently restated annual reports. Blankley, Hurtt, and MacGregor (2012) attain this finding among 404(b) engagements during 2004–2007, while Lobo and Zhao (2013) find it market-wide during 2000–2009. Because neither study explicitly compares 404(b) to non-404(b) engagements, it is not clear whether the benefit of abnormal auditor effort is particular to 404(b) engagements (i.e., 404(b) audits are driving the overall results of Lobo and Zhao [2103]), or applies to all audits, regardless of regime.

We address this issue by building on these two lines of research. We propose that the benefit of 404(b) in reducing misstatements (relative to other regimes) is greater as abnormal audit fees increase. In 404(b) engagements when fees are less constrained, auditors are able to apply incremental effort toward internal control testing that provides knowledge of the client and its systems. This knowledge improves the auditor's understanding of the distribution of control risk, which can be utilized in guiding substantive testing, focusing more (less) attention on areas with ineffective (effective) controls. In contrast, a fee-constrained 404(b) engagement might not allow sufficient effort to be applied to control testing, preventing a measureable benefit in misstatement reduction relative to non-404b engagements. In non-404(b) engagements, incremental audit effort likely comprises additional tests of details (e.g., more extensive confirmations of receivables or inventory counts).[2] Without guidance from deep knowledge of the distribution of control risk, those tests may not be focused on areas most subject to misstatements, leaving misstatements undetected.

Based on the above arguments, our first hypothesis proposes a synergistic effect, i.e., that sufficient resources must be spent to enable a level of testing that yields a good understanding of client controls. If this hypothesis is supported, then it implies that the overall effect of 404(b) observed by Nagy (2010) primarily occurs in audits with relatively higher fees, with important implications for audit fee discounting. Likewise, it would suggest that the overall effect of abnormal effort on financial reporting quality found by Lobo and Zhao (2013) primarily applies to 404(b) engagements, with important implications for the relative value of standard versus integrated audits. However, if auditors can gain sufficient knowledge to guide testing regardless of the level of abnormal effort (i.e., when fees are constrained), then we would detect an overall effect for 404(b) that is not dependent on abnormal fees.

We test the baseline expectation of a synergistic effect in a sample of 21,516 firm-year observations during 2002–2010. We first investigate whether the negative association of financial misstatements (i.e., subsequent restatements of financial reports of the period under audit) with abnormal effort is stronger under 404(b) relative to all non-404(b) engagements, including both SOX Section 302 and SOX 404(a)-only management testing.[3] This prediction is supported, showing an economically significant reduction in misstatement likelihood across the range of abnormal audit fees for accelerated filers under 404(b). As abnormal audit fees increase from the 25th to 75th percentile of the sample distribution, restatement likelihood decreases by 1.87 percent for engagements under 404(b).[4] In contrast, greater auditor effort does *not* reduce misstatement likelihood among non-accelerated filers not subject to 404(b).

Next, we compare companies under the 404(a)-only regime to companies under 404(b). If the association of abnormal audit fees and misstatement detection is weaker in 404(a)-only engagements, then this implies that relatively higher audit effort is of less value in improving financial reporting quality when auditors themselves have not performed the control testing. We find that greater auditor effort does *not* reduce misstatement likelihood in engagements subject to 404(a) only.[5] Thus,

[2] As noted by Curtis, Jenkins, Bedard, and Deis (2009, 85), testing of internal controls in non-404 engagements has traditionally been rare, as noted in both academic and practice literatures. While archival data cannot reveal which tests are performed by auditors, this implies that incremental testing with higher abnormal fees in non-404(b) engagements would focus primarily on tests of details. Although SAS No. 55 (AICPA 1988) and SAS No. 78 (AICPA 1997) require auditors to incorporate assessments of the control environment into the audit planning, such assessment is not comparable to the deep insights gained from actual documentation and testing of controls as required by 404(b) (Bedard and Graham 2011).

[3] SOX Section 302 refers to disclosure controls and Section 404 refers to internal control over financial reporting (i.e., ICFR). For consistency in our discussion we use "internal controls" to refer to both in the paper.

[4] We define firms that complied with 404(b) for at least one year during the sample period as accelerated filers, and define all other firms as non-accelerated filers.

[5] Because 404(b) is implemented based on firm size, one concern is that the effect of firm size may confound our results. Our main inference remains unchanged after we employ a battery of tests to control for the size effect through model specification and sample construction. For example, the greater benefit of abnormal audit effort under 404(b) persists when we restrict the sample to smaller accelerated filers, and compare to non-accelerated filers under 404(a) with fiscal years ending after December 15, 2007. Our results are also robust to a number of other sensitivity analyses, such as using alternative definitions of abnormal audit fees, addressing the correlated omitted variable problem, controlling for changes in auditors and in firm composition from the pre- to post-404(b) period, applying the Ai and Norton (2003) procedure, and dispelling other alternative explanations.

management's required 404(a) tests of controls either do not produce knowledge as useful as that gained from auditor testing (consistent with greater auditor expertise in internal control design and testing), or that knowledge is not fully communicated to auditors. This is consistent with recent research (e.g., Bedard and Graham 2011; Schroeder and Shepardson 2016), which finds that 404(a) management testing is ineffective without accompanying testing by auditors. In sum, our baseline results show that the benefit of ICFR testing in misstatement reduction is driven by 404(b) engagements with higher abnormal audit effort (i.e., positive abnormal audit fees). Importantly, engagements under 404(b) with negative abnormal fees do not outperform engagements under non-404(b) regimes in reducing misstatements. These results are robust to a number of sensitivity analyses.[6]

We next investigate the conditions under which incremental effort under 404(b) enhances auditors' ability to detect financial report misstatements. We expect that such benefits of SOX 404(b) might vary with the scope of internal control testing, usefulness of the information gained, and auditors' ability to identify risky areas even with minimal control testing. We first test whether the association between abnormal fees and misstatement reduction among 404(b) engagements varies longitudinally between full-scope (AS2) and limited-scope ("top-down") control testing (AS5).[7] If AS5 significantly limits the knowledge that auditors obtain from control tests, then the value of abnormal effort in misstatement reduction might be weakened after its implementation in 2007. Examining 10,944 accelerated filer observations from 2004–2010, we find no evidence of a weaker association of abnormal audit fees with misstatement reduction after the transition to AS5. This suggests that limited-scope testing under AS5 does not substantially impact auditors' acquisition and use of knowledge of internal controls in misstatement detection, relative to AS2.

Next, we examine whether the synergistic effect of abnormal auditor effort and internal control testing under 404(b) holds under conditions in which auditors' knowledge of the client's systems is likely to vary. First, we expect that the effects of audit effort on the benefits of 404(b) testing should be of greater value in shorter, relative to longer, tenure audits. After long tenure, the auditor likely already possesses significant knowledge about the client and its systems prior to the current engagement (Geiger and Raghunandan 2002; Johnson, Khurana, and Reynolds 2002; J. Myers, L. Myers, and Omer 2003; Carcello and Nagy 2004; Kinney and Shepardson 2011), enabling the identification of risky areas even without greater audit effort under 404(b). We find that the moderating effect of audit effort on the benefit of 404(b) for misstatement detection is most pronounced for engagements with short tenure, and significantly diminishes for engagements with medium tenure. For long-tenure engagements, 404(b) engagements have a lower likelihood of misstatements regardless of the level of abnormal effort.

We also test whether the interactive effect of abnormal auditor effort and internal control testing under 404(b) holds for both Big 4 and non-Big 4 auditors. There are conflicting possibilities for this comparison. Non-Big 4 auditors might possess less comprehensive understanding of clients' internal controls, relative to Big 4 auditors, and so might benefit more than Big 4 auditors from incremental effort applied in their 404(b) engagements. In contrast, non-Big 4 auditors might be less able to incorporate knowledge gained from control testing into audit planning and execution. We find that the interactive effect of abnormal audit effort and 404(b) is significant for both types of auditors. However, the effect is stronger for non-Big 4 auditors. While Big 4 firms achieve some level of misstatement reduction at the midpoint of audit fees, effort must be abnormally high for non-Big 4 firms in order to decrease misstatement likelihood. In a similar test, we find that although both industry specialist and non-specialist auditors benefit from internal control testing, the former experience greater improvement in misstatement reduction, consistent with industry-specialist auditors gaining more valuable knowledge from internal control audits and/or more effectively applying such knowledge to substantive tests.

This study makes several important contributions to the literature. First, this study contributes to understanding of the benefits of mandatory internal control testing, and specifically to the ongoing debate over the relative benefit of alternative regulatory regimes aimed at improving internal controls, particularly SOX 404(a)-only management testing. We demonstrate that overall, enhanced misstatement reduction requires both 404(b) and abnormal auditor effort.[8] This implies that the value of incremental audit effort when fees are relatively unconstrained depends on what kind of testing the auditor is doing. It also implies that the benefits of 404(b) hinge upon the level of audit effort, underscoring an important adverse consequence of audit

[6] Considerable prior research (e.g., Raghunandan and Rama 2006; Hoitash et al. 2008) shows that mean audit costs increased considerably after implementation of SOX 404. Our results are robust to factoring in the significantly higher average audit costs associated with 404(b) compliance in generating abnormal fees, our proxy for abnormal audit effort.

[7] The Public Company Accounting Oversight Board (PCAOB 2007) issued AS5 with the goal of lowering the costs while maintaining the benefits of 404(b). The PCAOB's expectation was fulfilled on the cost side, as shown by ample research (e.g., Jiang and Wu 2009; J. Krishnan, J. Krishnan, and Song 2011).

[8] Study of the value of 404(b) remains important even after the permanent exemption of all non-accelerated filers (the Dodd-Frank Act of 2010, U.S. House of Representatives 2010), as the exemption may yet be extended to firms with market capitalization between $75 and $250 million (small accelerated filers) (SEC 2010; SEC 2011). While the investor group and accounting firms vigorously oppose any additional exemption, business communities generally favor further relief. Recently, legislators propose extending the exemption on an even larger scale. See the "Background and Hypotheses Development" section for a detailed discussion of recent legislative initiatives to expand the exemption.

fee discounting. In sum, our research shows that the effect of each of these factors depends on the other; i.e., neither 404(b) nor higher than average auditor effort is effective alone. This important result has not been documented by prior research. Second, we contribute to research on the audit risk model such as Hogan and Wilkins (2008), who find that auditors react to different levels of control risk across different clients. While we cannot directly observe allocation of audit effort, our results suggest that insights gained from control testing enable the auditor to improve the benefits of incremental audit resources through better allocation of limited audit resource across different areas based on variation in control risk. Third, this study contributes directly to the current policy debate regarding mandatory audit firm rotation (PCAOB 2011; PCAOB 2013). Due to lack of client-specific knowledge, it may be difficult for auditors of new engagements to effectively detect misstatements. Our evidence suggests that to mitigate the potential negative effects of frequent audit firm rotation, regulators might consider requiring mandatory internal control audits for all non-accelerated filers during the first two years of engagement.

The rest of the paper proceeds as follows. The second section introduces the regulatory background, reviews related literature, and develops our research hypotheses. The third section discusses research methods, the fourth presents results, and the fifth concludes.

BACKGROUND AND HYPOTHESES DEVELOPMENT

Background

A basic tenet of auditing is that financial misstatements are more likely when controls are ineffective (SAS No. 55, AICPA 1988; SAS No. 78, AICPA 1997; SAS No. 110, AICPA 2006). The expected link between internal control and financial reporting quality as well as an increase in accounting failures prompted the Sarbanes-Oxley Act (U.S. House of Representatives 2002). SOX fundamentally changed U.S. public company disclosures by requiring reporting on internal controls through two regulations. SOX Section 302 (implemented for all public companies as of 2002) requires management to certify the effectiveness of disclosure controls on a quarterly and annual basis, but testing of internal control effectiveness is not required under SOX 302. In contrast, SOX 404(a) (404(b)) mandates managers (auditors) to assess the design and test the effectiveness of ICFR on an annual basis. Both 404(a) and 404(b) became effective for companies meeting criteria for accelerated filer status for fiscal years ending on or after November 15, 2004 (SEC 2011). However, due to concerns that 404(b) compliance costs (Raghunandan and Rama 2006; Hoitash et al. 2008; Krishnan et al. 2008) were disproportionately high for small firms (Charles River Associates [CRA] 2006; GAO 2006; SEC 2009), the SEC repeatedly delayed implementation for non-accelerated filers. Eventually, non-accelerated filers were required to comply with 404(a) for fiscal years ending on or after November 15, 2007, but were permanently exempted from 404(b) under the Dodd-Frank Act (U.S. House of Representatives 2010). Investigating whether and under what circumstances 404(b) can reduce financial statement misstatements is important because the Dodd-Frank Act exempts 60 percent of all public companies filing statutory reports with the SEC from 404(b) (SEC 2011).[9]

Hypotheses Development

SOX 404(b) versus Other Regimes

PCAOB standards for 404(b) integrated audits (AS2 and, later, AS5) require auditors to test ICFR for operating effectiveness. Prior research provides evidence consistent with overall higher financial reporting quality under 404(b), but few studies examine the circumstances under which these benefits are more or less likely to accrue.[10] Most studies find a positive overall association of 404(b) testing and improvement in financial reporting quality (using various outcome measures), including early studies by Doyle, Ge, and McVay (2007) and Ashbaugh-Skaife, Collins, Kinney, and LaFond (2009), and more recent work such as Schroeder and Shepardson (2016). However, Kinney and Shepardson (2011) adopt a different perspective by proposing that most of the benefits of 404(b) can be achieved through the less-costly option of 404(a) management control testing, coupled with a change in auditing standards.

[9] Recently, some politicians have proposed further deregulation based on the assumption that alternative internal control regimes can reasonably substitute for the mandatory SOX 404(b) (SEC 2011). In October 2011, U.S. Representative Stephen Fincher introduced a bill entitled "Small Company Job Growth and Regulatory Relief Act of 2011" to exempt public companies with market capitalization of up to $500 million from SOX 404(b). In the same bill, Fincher also suggested to exempt companies with market capitalization of $500 million–$1 billion from SOX 404(b) during the first five years after going public. In April 2012, the Congress passed the Jumpstart Our Business Startups (JOBS) Act. Under this act, emerging growth companies (EGC) that complete an initial public offering on or after December 8, 2011 are exempt from SOX 404(b) for up to five years. In July 2013, U.S. Representative Michael Fitzpatrick introduced a bill titled the "Fostering Innovation Act" to exempt companies with market capitalization of $250–$700 million and annual revenue under $100 million from SOX 404(b).

[10] Other benefits of 404(b) compliance documented by prior research include greater earnings informativeness (Chen et al. 2013), lower cost of equity and debt capital for voluntary adopters (Cassell, Myers, and Zhou 2013), greater improvement in accrual quality and revenue quality for accelerated filers relative to non-accelerated files across the change in internal control regimes (Krishnan and Yu 2012; Holder et al. 2013).

Regarding the specific outcome of misstatement reduction in financial reports, Nagy (2010) documents an overall reduction in misstatements for 404(b) firms relative to firms under 302 (for engagements in 2005, predating the 2007 requirement for mandatory 404(a) management testing). However, while Nagy (2010) examines an average improvement in financial reporting quality under 404(b), his study does not consider the mechanisms that lead to this improvement, or whether it varies with engagement characteristics. Further, Blankley et al. (2012) show that prior to AS5, misstatement reduction for engagements under 404(b) is greater for audits with higher abnormal audit effort (as proxied by abnormal fees). Their result suggests that when engagement effort is high (low) relative to client characteristics, the integrated audit has more (less) value.[11] However, economic theory (Matsumura and Tucker 1992) predicts, and empirical analysis (Lobo and Zhao 2013) finds, that greater audit effort should *in general* result in fewer misstatements. These studies in combination leave unresolved the issue of whether the benefit of incremental audit effort is universal or is limited to 404(b) engagements.[12]

This distinction is important because the nature of the knowledge acquired by the auditor differs across regulatory regimes. While auditing standards require auditors to adopt "risk-based audit methodologies" in planning and executing an engagement (PCAOB 2010), the auditor's knowledge *absent* control testing is based on assessing the documentation of control system design, inquiry of management personnel, and walk-throughs.[13] While those evidential procedures are also performed in 404(b) engagements, the auditor under 404(b) also acquires in-depth knowledge of the operating effectiveness of ICFR at the account/assertion level (PCAOB 2007, §42-45). With greater knowledge about the distribution of internal control risk, the auditor can shift effort away from areas with effective internal controls toward areas with deficient controls, thereby optimizing the allocation of limited audit resources. Based on such insights, the auditor is better prepared to identify sources of misstatements by asking, "what could go wrong?" given the detected control weaknesses, and concentrate on areas most prone to misstatements.

While the potential for improved knowledge exists under 404(b) relative to 404(a) and 302, its benefits can only be obtained if the auditor is able to invest sufficient resources to test and understand the controls. As the audit fee increases, engagement effort can increase, enabling more knowledge about the client's internal control to be obtained and used in planning the audit. Thereby, the auditor is more likely to accurately direct limited resources toward areas with ineffective controls, enabling misstatements to be detected and corrected. Thus, while Nagy (2010, 443) notes that under SOX 404 (b), "the required evaluation should help identify potential weaknesses and deficiencies in advance of a system breakdown," our baseline hypothesis proposes that this process will be less effective if the auditor does not exert sufficient effort when testing the controls to make the risk-based allocation. In non-404(b) engagements, we propose that incremental auditor effort will be less effective in misstatement reduction, as knowledge of client controls is less likely to be gained absent required control testing. Formally stated:

H1a: The negative association between abnormal audit fees and the likelihood of annual report misstatement is stronger under 404(b) than other regimes.

Following this baseline test, we narrow the focus to a comparison of accelerated filers under 404(b) versus non-accelerated filers under the 404(a)-only regime after November 15, 2007. To be valuable to auditors when they do not perform their own independent testing, knowledge obtained from management's 404(a) testing must be (1) comprehensive and accurate, (2) effectively communicated, and (3) incorporated into planning and execution of the audit. Prior studies using public data document that the incidence of MWs in management's 404(a) disclosures is understated (e.g., Hermanson and Ye 2009; Munsif, Raghunandan, and Rama 2013). Bedard and Graham (2011) are able to observe this understatement directly in a sample of proprietary data. These studies imply that the 404(a) process might have less benefit than 404(b) in directing auditors' attention to riskier areas, even at relatively high abnormal effort.[14] Consistent with this implication, Schroeder and

[11] An alternative interpretation for the negative association between audit fees and restatements is that auditors who charge higher fees are less likely to force their clients to restate misstated financial reports due to compromised independence. If this explanation holds, then we should observe a negative association between audit fees and restatements of both annual and quarterly reports. Lobo and Zhao (2013) report that such a negative association holds (does not hold) for annual (interim quarterly) report restatements, consistent with higher year-end audit effort reducing (not reducing) the misstatement likelihood of audited (unaudited) reports. These results are inconsistent with the compromised auditor independence explanation.

[12] Study of the value of 404(b) remains important even after the permanent exemption of all non-accelerated filers (the Dodd-Frank Act, U.S. House of Representatives 2010), as the exemption may yet be extended to firms with market capitalization between $75 and $250 million (small accelerated filers) (SEC 2010; SEC 2011). While the investor group and accounting firms vigorously oppose any additional exemption, business communities generally favor further relief. Recently, legislators propose extending the exemption on an even larger scale.

[13] Limited prior research summarized in Curtis et al. (2009) shows that auditors rarely test controls for effectiveness outside of the 404(b) environment.

[14] Results of research using public data are mixed. Schroeder and Shepardson (2016) find improvement in internal control quality for 404(b), but not for 404(a), suggesting no incremental benefits to 404(a) relative to SOX 302. However, Kinney and Shepardson (2011) find similar patterns of MW disclosure for small firms in the initial years of 404(a) and 404(b). Considering the higher costs of 404(b), they conclude that 404(a) might be a cost-effective alternative to 404(b).

Shepardson (2016) find no association of 404(a) management testing with financial reporting quality measured as quarterly accruals. H1b proposes a stronger interaction of 404(b) with abnormal audit fees, relative to the 404(a)-only regime:

H1b: The negative association between abnormal audit fees and the likelihood of annual report misstatement is stronger for firms under 404(b) than for firms under 404(a) only.

Differential Value of Incremental Knowledge of Client Controls under SOX 404(b)

Next, we investigate whether the association of abnormal effort with misstatement reduction under 404(b) varies depending on factors that could affect the knowledge of ICFR gained by the auditor, and/or the auditor's ability to use that information in planning a more effective audit.

Variation in Auditing Standards: AS2 versus AS5

We first examine whether the association of abnormal audit effort with misstatement reduction changed following the implementation of AS5 for accelerated filers (fiscal years ending on or after November 15, 2007). Reflecting on the benefits and costs of 404(b), Kinney, Martin, and Shepardson (2013, 807) comment that "AS2 required operational effectiveness testing of controls for all relevant assertions related to all significant accounts and disclosures and focused AS2-era audits on process-level testing rather than entity-wide controls (PCAOB 2004, para. 104)." In contrast, AS5 prescribes that auditors use a risk-based, top-down approach to internal control testing, scaling back testing of controls deemed not critical for financial reporting quality (PCAOB 2007). Also, under AS5, auditors may use the work of others, such as management or internal auditors.

The PCAOB's intent in changing this standard was to reduce the costs of 404(b) while maintaining its benefits. If this objective was met, then there should be no observed differences in financial reporting quality across these regulatory regimes. While several studies find the expected audit fee reductions under AS5 (e.g., Jiang and Wu 2009; Krishnan et al. 2011), results of research on financial reporting quality are thus far mixed. Wang and Zhou (2012) find no differences in several measures of earnings quality and MW disclosure for 404(b) engagements after AS5, and Kinney and Shepardson (2011, 440) note "inconclusive evidence" regarding differences in effectiveness across regimes.[15]

In our setting, similar effectiveness across regimes implies that incremental audit effort under AS5 (i.e., reduced process-level testing and greater emphasis on entity-wide controls) would provide a similar level of relevant knowledge of ICFR relative to full-scope testing under AS2, and the association with misstatement reduction would not change. However, if the knowledge of controls gained by the auditor in AS5's top-down approach is less valuable in directing more focused substantive testing, then some benefit of control testing will have been lost in the transition. Based on the lack of evidence in prior research of differences across regimes, we propose a non-directional hypothesis:

H2: Within firms complying with 404(b), the negative association between abnormal audit fees and the likelihood of annual report misstatement does not differ between the AS5 and AS2 regimes.

Variation in the Auditor's Ability to Use Tests of Controls to Identify Risky Areas

We next consider whether the incremental benefit of abnormal effort under 404(b) differs based on factors that might affect the auditor's use of internal control knowledge to identify risky areas: the length of the auditor/client relationship and audit firm size. Research often finds that shorter tenure is associated with lower audit quality (Geiger and Raghunandan 2002; Johnson et al. 2002; Myers et al. 2003; Carcello and Nagy 2004; Gul, Fung, and Jaggi 2009), likely due to the lack of client-specific knowledge. Per AS12 (PCAOB 2010), auditors in continuing engagements should use knowledge obtained from past audits to shift effort toward high risk areas, since the auditor may source internal control problems based on such knowledge (Kinney and Shepardson 2011). However, developing in-depth client-specific knowledge requires significant time. Thus, knowledge of internal controls gained from 404(b) testing could be especially beneficial in the early years of engagements when auditors are less familiar with their clients.

H3a: The stronger negative association between abnormal audit fees and the likelihood of annual report misstatement under 404(b) is stronger among engagements with shorter tenure than engagements with medium or longer tenure.

Prior research also examines the association between auditor size class and audit quality (DeAngelo 1981; Francis 2004). Much of the research on auditor size finds that larger audit firms are associated with better financial reporting quality (Becker,

[15] Focusing on unaudited quarterly reports, Schroeder and Shepardson (2016) find a reduction in internal control quality after transition to AS5.

DeFond, Jiambalvo, and Subramanyam 1998; Francis, Maydew, and Sparks 1999; Lennox and Pittman 2010). This finding is attributed to such differences as investments in staff recruitment and training, audit technologies and well-developed audit programs, and support from their respective national offices. Through these means, large audit firms are more capable of identifying and concentrating on risky areas during the audit. In contrast, in the absence of control testing, smaller audit firms might have developed less comprehensive understanding of clients' internal controls through financial statement audits and thus might benefit more from the knowledge gained from control testing. This implies a relatively stronger association between audit effort and misstatements under 404(b) for smaller audit firms. However, non-Big 4 auditors might also be less able to assess clients' internal controls and incorporate knowledge gained from control testing into audit planning and execution, which would imply a weaker association of auditor effort with misstatement reduction for clients of those firms. We thus propose the following non-directional hypothesis:

H3b: The stronger negative association between abnormal audit fees and the likelihood of annual report misstatement under 404(b) does not differ between non-Big 4 and Big 4 auditors.

METHODS

Sample Development

We merge audit-related data from Audit Analytics with financial variables from Compustat and stock returns from CRSP. Our sample period starts in 2002, the first year SOX 302 became effective, and ends in 2010. To allow for sufficient time to elapse between misstated periods and restatement announcements, we search the Audit Analytics Advanced Non-Reliance Restatement database for restatements announced through 2012.[16] From observations with requisite data for estimating Model (1), we remove observations in the financial industries, which are subject to separate internal control regulation under FDICIA (Altamuro and Beatty 2010), as well as in other regulated industries.[17] We define firms that complied (did not comply) with 404(b) for at least one year during the sample period as accelerated (non-accelerated) filers. The full sample comprises 21,516 observations for 4,142 unique firms, among them 16,490 (5,026) observations belong to 2,669 (1,473) accelerated (non-accelerated) filers. We restrict the 404(b) audits to only those in mandatory compliance with 404(b). In the sensitivity analyses, we exclude the 695 observations in voluntary compliance with 404(b) from the full sample and obtain similar results. Our results remain consistent when we control for these voluntary compliance firms, as detailed in footnote 29. See Table 1 for the sample selection process.

Empirical Models and Variables

We test H1a concerning the incremental benefits of abnormal audit effort under 404(b) relative to all other regimes using the following logistic regression (firm and year subscripts omitted):

$$\begin{aligned} RESTK = {} & \alpha_0 + \alpha_1 ABFEE + \alpha_2 TEST404B + \alpha_3 ABFEE{*}TEST404B + \alpha_4 LARGE + \alpha_5 ABFEE{*}LARGE + \beta_1 MW302 \\ & + \beta_2 F\_SCORE + \beta_3 RESTPRIOR + \beta_4 TA + \beta_5 AGE + \beta_6 NEG\_EQUITY + \beta_7 ROA + \beta_8 LOSS \\ & + \beta_9 CURRENT\_ACCRUAL + \beta_{10} MERGER + \beta_{11} FIN + \beta_{12} LEV + \beta_{13} INV\_INT\_COV \\ & + \beta_{14} EXT\_FIN\_DEMAND + \beta_{15} SALEGR + \beta_{16} BM + \beta_{17} BIG4 + \beta_{18} SPECIALIST + \beta_{19} LOGTENURE \\ & + \beta_{20} OFFICESIZE + \{YEAR\} + \{IND\} + \varepsilon \end{aligned} \quad (1)$$

The dependent variable *RESTK* equals 1 if the current-year's audited annual financial report is subsequently restated, 0 otherwise. Consistent with prior research (e.g., Blankley et al. 2012; Lobo and Zhao 2013; Eshleman and Guo 2014), we rely on abnormal audit fees (*ABFEE*) to proxy for audit effort, as the effects of client size, complexity, and risk are removed when computing the abnormal component (Kinney and Libby 2002). *TEST404B* equals 1 if the auditor issues an opinion on internal control effectiveness in mandatory compliance with SOX Section 404(b), 0 otherwise.

The SEC mandates 404(b) for companies meeting specific criteria such as firm size as measured by public float. To alleviate the concern that the effect of 404(b) measured using Model (1) is caused by size differences between accelerated and non-accelerated filers rather than the 404(b) regime, we control for firm size (*LARGE*) and its interaction term (*ABFEE* ∗

[16] The Audit Analytics Advanced Non-Reliance Restatement database excludes all technical restatements (e.g., restatements due to changes in accounting principle, mergers and acquisitions, discontinued operations) that do not imply a misstatement in the original filings (Lobo and Zhao 2013, 1395). To ensure that we adequately exclude all technical restatements, we manually inspect the restatement reasons disclosed by Audit Analytics for the 1,789 annual report restatements in our full sample and find none of them solely involves a technical restatement.

[17] When we include firms in regulated industries in the analysis, the results are consistent throughout.

TABLE 1

Sample Selection

All observations available in Compustat during 2002–2010	80,028
Less: observations with missing value for audit-related control variables in Audit Analytics	(26,885)
Less: observations with missing value for non-audit related control variables	(19,851)
Less: observations with missing value for abnormal audit fees	(9,943)
Less: observations in financial service industry	(1,121)
Less: observations in regulated industries	(712)
Final Sample	21,516

LARGE). *LARGE* equals 1 if the market value of common equity is no less than $75 million, 0 otherwise.[18] In Model (1), α_1 captures the benefits of audit effort for firms not meeting this size criterion. Coefficient α_5 captures the difference between firms meeting the size criterion for accelerated filer status and other firms, before 404(b) compliance. The coefficient for the test variable α_3 captures the incremental benefit in misstatement reduction per unit of abnormal effort for accelerated filers under 404(b). H1a predicts $\alpha_3 < 0$.

To test the prediction in H1b that misstatement reduction associated with abnormal audit effort is lower under the 404(a)-only regime relative to 404(b), we restrict the sample to non-accelerated filers with fiscal years ending after the effective date of mandatory 404(a) and more size-comparable accelerated filers during the same period. To test H2 (a non-directional hypothesis regarding the longitudinal variation between the AS2 and AS5 regimes), we limit the sample to firms under 404(b). We then construct an indicator for observations under AS5, and test the interaction of that indicator variable with *ABFEE*. Our remaining hypotheses concern whether the incremental benefit of abnormal audit effort in misstatement reduction under 404(b) varies by auditor tenure (H3a) and auditor size (H3b). To test these hypotheses, we partition the sample by the relevant variables, estimate Model (1) separately for each subsample, and compare the coefficients on *ABFEE* $*$ *TEST404B* between the subsamples.[19]

Based on the audit risk model, the above specification also includes variables measuring control risk, inherent risk, and other determinants of audit risk. We follow recent research on accounting misstatements to specify variables surrogating for these risk factors (Burns and Kedia 2006; Erickson, Hanlon, and Maydew 2006; Efendi, Srivastava, and Swanson 2007; Lennox and Pittman 2010; Lobo and Zhao 2013; Francis, Michas, and Yu 2013). We proxy for control risk using *MW302*, which equals 1 if a MW is disclosed in at least one current-year quarterly internal control report under SOX 302, 0 otherwise. We then use 15 variables to control for inherent risk. We control for the predicted probability of future restatement (*F_SCORE*), as well as prior restatements in financial reports (*RESTPRIOR*) and expect both variables to load positively (Dechow, Ge, Larson, and Sloan 2011; Lobo and Zhao 2013). We control for company size (*TA*) and age (*AGE*). Larger companies are more likely to restate (Burns and Kedia 2006; Lennox and Pittman 2010; Lennox and Li 2014) due to their operating and accounting complexity, whereas older firms are less likely to restate (Brazel, Jones, and Zimbelman 2009; Lennox and Pittman 2010) possibly owing to their well-established accounting policies and procedures. We include negative equity (*NEG_EQUITY*), return on assets (*ROA*), current-year loss (*LOSS*), and current accruals (*CURRENT_ACCRUAL*) to account for the effects of financial performance on misstatement risk, and we control for current-year merger and acquisition (*MERGER*), current-year financing (*FIN*), leverage (*LEV*), inverse interest coverage (*INV_INT_COV*), and the demand for external financing (*EXT_FIN_DEMAND*) to capture the influence of acquisitions/external financing activities on financial reporting incentives. We anticipate a positive association between future restatements and *MERGER* (Stanley and DeZoort 2007; Lennox and Pittman 2010), *FIN* (Efendi et al. 2007), and *INV_INT_COV* (Efendi et al. 2007). We include sales growth (*SALEGR*) and book-to-market ratio (*BM*) to control for the effects of growth opportunities on restatement probability. Finally, we include four auditor-specific variables to capture auditor characteristics: a Big 4 auditor indicator (*BIG4*), an industry-specialist auditor indicator measured at national level (*SPECIALIST*), audit firm tenure (*LOGTENURE*), and audit office size (*OFFICESIZE*). We predict a negative association between future restatements and *BIG4* (Lennox and Pittman 2010), *SPECIALIST* (Chin and

[18] Our sample includes 1,665 observations during 2004–2010 with market capitalization exceeding $75 million that do not comply with SOX 404(b). These observations were not subject to 404(b) for several reasons, including fiscal year-end cutoff for initial compliance, public float at the end of the second fiscal quarter, mergers and acquisitions, and IPOs. We re-estimate Model (1) after excluding these 1,665 observations and the coefficient for *ABFEE* $*$ *TEST404B* remains negative and significant at $p < 0.01$.

[19] Using partitioned samples to test these hypotheses has the advantage of allowing all predictors to vary across subsamples while avoiding potentially severe multicollinearity and the complexity in coefficient interpretation associated with including a three-way interaction term in a logistic regression (Aiken and West 1991; Ai and Norton 2003).

Chi 2009), and *OFFICESIZE* (Francis et al. 2013). We include year and industry fixed effects to control for variation in restatement frequency across the sample period (Cheffers, Whalen, and Usvyatsky 2013) and across industries (Dechow et al. 2011). To diminish the influence of outliers and within-firm time series correlation, we winsorize all continuous variables at the 1st and 99th percentile and cluster residuals by firm. See Appendix A for detailed variable definitions.

Estimation of Abnormal Audit Fees

We estimate abnormal audit fees with all 28,644 observations with available data during the sample period. Following prior research, variables in the model used to generate abnormal fees include *F_SCORE, RESTPRIOR, TA, SQSEG, PENSION, FIN, MERGER, INV, REC, ROA, LOSS, GC, BM, LEV, ABRET, DEC, BIG4, SPECIALIST, LOGTENURE, DELAY, MW302,* as well as industry and year indicators. In Table 2, we tabulate results for two alternate audit fee regressions, which produce alternative measures of abnormal fees. Results in both columns are broadly consistent with the findings of prior research (Hay, Knechel, and Wong 2006). In Column (1), the audit fee model includes *TEST404B,* and thus the residual from that model (*ABFEE1*) excludes the average incremental control testing costs of 404(b) engagements. In Column (2), the audit fee model excludes *TEST404B,* and thus the abnormal audit fees generated from that model (*ABFEE2*) include the average incremental costs of 404(b). We believe that *ABFEE1* better serves as our empirical construct of abnormal audit effort and thus present results using *ABFEE1* for all main tests. However, because omitting *TEST404B* from the audit fee regression biases the abnormal fees upward for observations complying with 404(b), and biases the abnormal fees downward for observations not complying with 404(b), using *ABFEE2* tends to bias against finding a negative coefficient for *ABFEE* ∗ *TEST404B*. To ensure the robustness of our results to these two measures of abnormal audit fees, we estimate all of the main regressions using both. Our main results are insensitive to the use of either measure, or to computing abnormal fees separately under each regime.[20]

RESULTS

Descriptive Statistics

Table 3, Panel A displays descriptive statistics for the full sample, showing comparability with prior research. On average, 8.3 percent of firm-years have annual reports that are subsequently restated (*RESTK*), comparable to the 7.7 percent reported in Lobo and Zhao (2013). Auditors report on an internal control effectiveness of 50.9 percent of the full sample under 404(b) (*TEST404B*). The mean (median) of logged total audit costs is 13.348 (13.339) (*AUDFEE*), consistent with the 13.131 (13.255) reported by Bills, Jeter, and Stein (2015) for 2004–2009.[21] About 10.5 percent of firm-years report SOX 302 MWs (*MW302*), somewhat higher than the 8.7 percent reported by Leone (2007) in 2003–2004.

Compared with other observations and consistent with prior research, firm-years undergoing 404(b) audits have significantly higher abnormal audit fees, but exhibit significantly lower annual report restatement likelihood overall. However, these univariate comparisons do not reveal whether the relative value of control testing in misstatement prevention is greater under 404(b),[22] which is addressed in our multivariate models. Table 3, Panel B reports an approximately equal number of observations with and without internal control audits, with the majority of accelerated filers starting to comply with 404(b) during 2004–2005. Changes in the restatement frequency of accelerated filers around 404(b) implementation could be driven by factors affecting the entire audit market rather than by 404(b). We test this in Panel C and observe that accelerated filers experience a 7.47 percent reduction in restatement probability from the pre- to post-404(b) period, significantly higher than the 3.13 percent reduction for non-accelerated filers from pre- to post-2004,[23] suggesting that the reduction in restatement

[20] Doogar, Sivadasan, and Solomon (2015) show that abnormal audit fees largely reflect unobserved audit production costs (including any risk premium and a normal rate of return on all factors of production) instead of abnormal rents earned by the auditor. It is important to note that while our model for generating the abnormal audit fees includes a comprehensive set of variables to control for audit risk, such measures may not be complete and, therefore, the abnormal audit fees could contain some degree of risk premium. However, the presence of a risk premium would bias against finding the expected negative association between abnormal audit fees and restatements, since only higher audit effort, not a risk premium, can reduce misstatements.

[21] Since our abnormal fee estimation sample is larger than the final full sample, the mean value for abnormal audit fees does not equal zero.

[22] The fact that audit fees are higher and the restatement rate is lower under 404(b) does not necessarily imply a structural shift in the negative association between audit effort and restatements under 404(b). For example, without 404(b), the auditor may exert 10 units of audit effort and reduce restatement likelihood by 1 percent, i.e., each unit of audit effort reduces restatement likelihood by 0.1 percent. If under 404(b) the auditor exerts 20 units effort and reduces restatement likelihood by 2 percent, then there will be no structural shift in the negative association between audit effort and restatement, even though we observe higher audit effort and lower restatement likelihood under 404(b). If it is the case, then the *ABFEE* ∗ *TEST404B* coefficient should be 0 in Model (1).

[23] Because non-accelerated filers do not comply with 404(b), we calculate the change in restatement probability for non-accelerated filers from the pre-2004 (2002–2003) to post-2004 (2004–2010) period.

TABLE 2

Estimation of Abnormal Audit Fees

	(1) Dep. Var. = *AUDFEE* (Residuals = *ABFEE1*)		(2) Dep. Var. = *AUDFEE* (Residuals = *ABFEE2*)	
	Full Sample Include *TEST404B*		Full Sample Exclude *TEST404B*	
Sample	**Coeff. Est.**	**t-stat.**	**Coeff. Est.**	**t-stat.**
Intercept	8.365	92.54***	8.376	92.68***
TEST404B	0.254	16.93***		
F_SCORE	1.298	7.36***	1.628	9.21***
RESTPRIOR	0.051	3.30***	0.049	3.17***
TA	0.454	75.82***	0.474	83.02***
SQSEG	0.199	13.34***	0.195	13.10***
PENSION	0.038	2.42**	0.046	2.96***
FIN	−0.014	−1.40	−0.019	−1.86*
MERGER	0.131	8.03***	0.135	8.27***
INV	0.113	1.66*	0.083	1.22
REC	0.593	8.12***	0.565	7.66***
ROA	−0.168	−7.08***	−0.164	−6.80***
LOSS	0.162	11.97***	0.154	11.27***
GC	0.140	5.69***	0.119	4.75***
BM	−0.099	−10.60***	−0.115	−12.14***
LEV	0.071	2.64***	0.034	1.24
ABRET	−0.058	−8.05***	−0.068	−9.38***
DEC	0.057	3.01***	0.075	3.99***
BIG4	0.405	21.03***	0.444	22.73***
SPECIALIST	0.060	3.21***	0.056	3.04***
LOGTENURE	−0.003	−0.32	0.001	0.12
DELAY	0.259	15.24***	0.259	15.15***
MW302	0.299	14.95***	0.299	14.52***
YEAR	Yes		Yes	
INDUSTRY	Yes		Yes	
n	28,644		28,644	
Adjusted R^2	0.802		0.798	
Sample Period	2002–2010		2002–2010	

***, **, * Denote two-tailed significance at the 1 percent, 5 percent, and 10 percent levels, respectively.
In Columns (1) and (2), we estimate abnormal audit fees with all 28,644 observations with available data during the sample period. *ABFEE1* is the residual estimated from the regression in Column (1) with *TEST404B* included in the model. *ABFEE2* is the residual estimated from the regression in Column (2) without *TEST404B* included in the model.
See Appendix A for variable definitions.

frequency of accelerated filers cannot be fully explained by changes in the general economic conditions, the regulatory environment, or the audit market structure from pre- to post-2004.[24]

Tests of H1a and H1b: Incremental Benefit of Audit Effort under 404(b)

Preliminary main effects model. Table 4 presents results of estimating several forms of Model (1). As a preliminary step, Column (1) shows results of a main effects model that replicates findings of both Nagy (2010) and Lobo and Zhao (2013) in our

[24] In an untabulated test, the restatement probability for accelerated filers declined from 17.36 percent to 6.82 percent from the pre-2004 to post-2004 period. This reduction of 10.54 percent is greater than the corresponding 3.13 percent reduction for non-accelerated filers during the same period ($p < 0.01$).

TABLE 3

Descriptive Statistics

Panel A: Descriptive Statistics for Full Sample

	Full Sample (n = 21,516)					*TEST404B* = 0 (n = 10,572)		*TEST404B* = 1 (n = 10,944)	
Variable	**Mean**	**Std. Dev.**	**P25**	**P50**	**P75**	**Mean**	**Median**	**Mean**	**Median**
RESTK	0.083	0.276	0.000	0.000	0.000	0.102	0.000	0.065***	0.000***
ABFEE1	0.030	0.544	−0.330	0.032	0.387	0.017	0.006	0.042***	0.057***
ABFEE2	0.031	0.547	−0.325	0.040	0.390	−0.038	−0.039	0.098***	0.107***
AUDFEE	13.348	1.276	12.399	13.339	14.206	12.588	12.468	14.083***	14.004***
TEST404B	0.509	0.500	0.000	1.000	1.000				
LARGE	0.736	0.441	0.000	1.000	1.000	0.463	0.000	1.000***	1.000***
MW302	0.105	0.306	0.000	0.000	0.000	0.093	0.000	0.116***	0.000***
F_SCORE	0.114	0.042	0.091	0.109	0.126	0.111	0.104	0.116***	0.112***
RESTPRIOR	0.143	0.351	0.000	0.000	0.000	0.125	0.000	0.161***	0.000***
TA	5.657	2.026	4.184	5.606	7.024	4.634	4.374	6.646***	6.527***
AGE	2.585	0.782	2.079	2.565	3.135	2.441	2.398	2.723***	2.639***
NEG_EQUITY	0.052	0.222	0.000	0.000	0.000	0.062	0.000	0.042***	0.000***
ROA	−0.031	0.159	−0.092	0.025	0.078	−0.158	−0.006	−0.003***	0.044***
LOSS	0.399	0.490	0.000	0.000	1.000	0.514	1.000	0.289***	0.000***
CURRENT_ACCRUAL	0.003	0.100	−0.026	0.002	0.034	−0.001	0.001	0.006***	0.004***
MERGER	0.076	0.265	0.000	0.000	0.000	0.042	0.000	0.109***	0.000***
FIN	0.602	0.489	0.000	1.000	1.000	0.572	1.000	0.631***	1.000***
LEV	0.518	0.454	0.288	0.470	0.647	0.528	0.452	0.508***	0.486***
INV_INT_COV	0.660	0.834	0.046	0.172	2.000	0.879	0.327	0.448***	0.116***
EXT_FIN_DEMAND	0.050	0.218	0.000	0.000	0.000	0.079	0.000	0.022***	0.000***
SALEGR	0.203	0.781	−0.042	0.080	0.236	0.202	0.057	0.204	0.097***
BM	0.470	1.223	0.238	0.441	0.734	0.492	0.486	0.449***	0.410***
BIG4	0.742	0.437	0.000	1.000	1.000	0.619	1.000	0.861***	1.000***
SPECIALIST	0.103	0.303	0.000	0.000	0.000	0.101	0.000	0.104	0.000
LOGTENURE	1.781	0.901	1.099	1.792	2.398	1.557	1.609	1.997***	2.079***
OFFICESIZE	3.179	1.283	2.303	3.178	3.989	3.053	3.068	3.300***	3.296***

Panel B: Annual Distribution of Firm-Years with and without Mandatory Compliance with SOX 404(b)

	TEST404B = 0			*TEST404B* = 1		
Year	**n**	***RESTK* = 1**	**Restatement %**	**n**	***RESTK* = 1**	**Restatement %**
2002	2,387	311	13.03%			
2003	2,627	410	15.61%			
2004	1,254	162	12.92%	1,348	150	11.13%
2005	841	46	5.47%	1,680	155	9.23%
2006	750	39	5.20%	1,714	121	7.06%
2007	670	34	5.07%	1,684	88	5.23%
2008	819	37	4.52%	1,442	81	5.62%
2009	648	29	4.48%	1,545	66	4.27%
2010	576	13	2.26%	1,531	47	3.07%
Total	10,572	1,081	10.23%	10,944	708	6.47%

(continued on next page)

sample. Specifically, the negative and significant coefficient for *TEST404B* ($p < 0.01$) is consistent with Nagy (2010), implying that likelihood of restatements is overall lower under 404(b). Also, the negative and significant coefficient for *ABFEE* ($p < 0.01$) is consistent with prior research (Blankley et al. 2012; Lobo and Zhao 2013), suggesting that higher abnormal audit effort is associated with an overall lower likelihood of restatements. As noted previously, assuming that these two effects are

TABLE 3 (continued)

Panel C: Changes in the Probability of Annual Report Restatements for Non-Accelerated and Accelerated Filers from the Pre-2004 (Pre-404(b)) to Post-2004 (Post-404(b)) Period

	Non-Accelerated Filers			Accelerated Filers			Difference	
Year	**n**	***RESTK* = 1**	**Restatement %**	**n**	***RESTK* = 1**	**Restatement %**	**t-stat.**	**p-value**
Pre-2004 *TEST404B* = 0	1,639	135	8.24%	5,546	773	13.94%	6.93***	< 0.001
Post-2004 *TEST404B* = 1	3,387	173	5.11%	10,944	708	6.47%	3.06***	0.002
Δ*Restatement %*			−3.13%			−7.47%	−2.59***	0.009
t-stat.			4.02***			14.33***		
p-value			< 0.001			< 0.001		

*** Denote that the difference in mean (median) between subsamples are significant in a two-tailed test at the 1 percent level.
Panel A presents descriptive statistics for all variables used in the main tests. Panel B presents the annual distribution of the total number of observations and the number of observations with annual report restatement separately by whether an observation is under mandatory 404(b) compliance. Panel C displays the change in annual report restatement probability from the pre- to post-2004 period for non-accelerated filers, and the change in annual report restatement probability from the pre- to post-404(b) implementation for accelerated filers.

independent implies that either 404(b) or abnormally high audit effort is individually sufficient for higher audit quality. We test if this is the case by considering whether the effect of each factor depends on the other.

Test of H1a. Column (2) reports results of Model (1) including the interaction term *ABFEE* ∗ *TEST404B,* testing the prediction in H1a that the benefit of 404(b) in misstatement reduction increases with abnormal effort. Due to inclusion of the indicator *LARGE,* the reference group in Column (2) is all non-404(b) observations that do not meet the size criterion for accelerated filer status. The *ABFEE* ∗ *TEST404B* coefficient is negative and significant ($p < 0.01$), consistent with H1a. Importantly, the insignificant coefficient on *ABFEE* in Column (2) indicates that for non-accelerated filers (observations not under 404(b)), higher audit effort does not reduce restatement likelihood. Further, the negative and significant coefficient on *TEST404B* ($p < 0.01$) implies that this regime is associated with a reduction in restatement likelihood for observations with zero abnormal audit fees (i.e., the midpoint). The insignificant coefficient on *ABFEE* ∗ *LARGE* suggests that the higher audit benefits for companies of the size of accelerated filers is observable only when they are in compliance with 404(b).[25,26]

To illustrate the relative importance of abnormal audit effort in misstatement reduction, Figure 1 graphs the predicted probabilities of a misstatement for 404(b)/non-404(b) engagements at five levels of the distribution of abnormal audit fees.[27] Figure 1 shows that the predicted probability of a misstatement for firms under 404(b) steadily decreases from 0.12 to 0.02 at minus two to plus two standard deviations of abnormal fees, compared with an insignificant reduction from 0.09 to 0.06 under other regimes. These results imply that 404(b) audits are not more effective at constraining misstatements than non-404(b) audits when the abnormal fees are below the mean. This result suggests that in order to gain the beneficial effect of 404(b), the auditor must have the resources to perform sufficient ICFR testing to gain enough knowledge to plan the audit effectively. Thus, the benefit of 404(b) in reducing misstatements observed by Nagy (2010) is likely driven by observations with average or higher levels of audit effort.

To illustrate, we calculate the marginal effect of *TEST404B* while holding *ABFEE* at its mean. To reconcile to Nagy (2010), we remove the interaction term *ABFEE* ∗ *TEST404B* from the model and re-estimate the regression. The coefficient for *TEST404B* is −0.263 (z = −2.89) and the marginal effect for *TEST404B* is a 1.5 percent reduction for the full sample. However,

[25] To examine the robustness of our results, we re-estimate Model (1) using the full sample after removing *LARGE* and *ABFEE* ∗ *LARGE* from the regression. When measuring *ABFEE* with *ABFEE1,* the coefficient for *ABFEE* is −0.106 (z = −1.51), and the coefficient for *ABFEE* ∗ *TEST404B* is −0.364 (z = −3.30). Results are similar using *ABFEE2*. Therefore, our results are not sensitive to the inclusion or exclusion of *LARGE* and its interaction terms.

[26] *TEST404B* captures size from 2004 onward, and thus there is overlap with *LARGE* after implementation of 404(b). To test whether results are sensitive to measuring *LARGE* solely in the pre-404(b) period, in Model (1) we replace *LARGE* with *LARGEPRE,* which equals 1 for firms with market capitalization greater than $75 million in the pre-404(b) period only, 0 otherwise. The untabulated coefficient on *ABFEE* ∗ *TEST404B* is −0.384 and significant ($p < 0.01$), the coefficient on *ABFEE* ∗ *LARGEPRE* is −0.041 and insignificant, and the two interaction terms are different ($p < 0.01$). This implies our results are not sensitive to these alternative ways of defining firm size.

[27] To obtain these values, we split the sample based on 404(b) compliance and re-estimated the regression in Column (2) after removing the interaction terms. Replicating results in Table 4, Column (2), *ABFEE1* is negative and significant ($p < 0.01$) for the subsample under 404(b) (n = 10,944), and is insignificant for the subsample not under 404(b) (n = 10,572).

TABLE 4

SOX 404(b) Compliance and Auditor Prevention of Annual Report Misstatements

	(1) Full Sample (2002–2010) *ABFEE = ABFEE1* Coeff. (z-stat.)	(2) Full Sample (2002–2010) *ABFEE = ABFEE1* Coeff. (z-stat.)	(3) Non-Accelerated Filers and Small Accelerated Filers (Market Cap < $250M) (2002–2010) *ABFEE = ABFEE1* Coeff. (z-stat.)	(4) Accelerated Filers Only (2002–2010) *ABFEE = ABFEE1* Coeff. (z-stat.)	(5) Non-Accelerated Filers under Mandatory 404(a) and Small Accelerated Filers (Market Cap < $250M) (2007–2010) *ABFEE = ABFEE3* Coeff. (z-stat.)
Intercept	−4.206***	−4.202***	−5.202***	−3.627***	−6.345***
	(−15.80)	(−15.80)	(−12.03)	(−13.95)	(−7.78)
ABFEE	−0.226***	−0.033	0.003	−0.207***	0.085
	(−3.73)	(−0.27)	(0.02)	(−2.96)	(0.34)
TEST404B	−0.271***	−0.269***	−0.335**	−0.199**	0.058
	(−2.99)	(−2.97)	(−2.34)	(−2.06)	(0.20)
*ABFEE * TEST404B*		−0.336***	−0.689***	−0.253**	−0.971***
		(−2.90)	(−3.13)	(−2.49)	(−2.66)
LARGE	0.593***	0.587***	0.412***		
	(5.74)	(5.65)	(3.57)		
*ABFEE * LARGE*		−0.082	0.133		
		(−0.58)	(0.76)		
MW302	0.080	0.076	0.207	0.093	0.750***
	(0.80)	(0.77)	(1.47)	(0.98)	(2.77)
F_SCORE	0.748	0.809	1.364	1.124*	0.555
	(1.09)	(1.19)	(1.45)	(1.65)	(0.21)
RESTPRIOR	1.370***	1.371***	1.407***	1.318***	1.110***
	(21.62)	(21.57)	(14.27)	(19.22)	(4.69)
TA	0.035	0.035	0.152***	0.026	0.282***
	(1.26)	(1.23)	(3.10)	(1.16)	(2.71)
AGE	−0.167***	−0.164***	−0.036	−0.171***	−0.018
	(−3.03)	(−2.97)	(−0.45)	(−3.94)	(−0.11)
NEG_EQUITY	0.292*	0.293*	0.037	0.245	−0.565
	(1.65)	(1.66)	(0.15)	(1.50)	(−1.00)
ROA	−0.047	−0.057	−0.087	0.031	−0.237
	(−0.58)	(−0.71)	(−0.96)	(0.27)	(−1.42)
LOSS	0.015	0.011	−0.063	0.019	−0.013
	(0.17)	(0.13)	(−0.48)	(0.21)	(−0.04)
CURRENT_ACCRUAL	−0.371	−0.368	−0.578*	−0.356	0.459
	(−1.35)	(−1.34)	(−1.73)	(−1.04)	(0.63)
MERGER	−0.106	−0.107	−0.284	−0.094	−0.007
	(−0.83)	(−0.85)	(−1.10)	(−0.80)	(−0.02)
FIN	0.211***	0.207***	0.158	0.219***	0.051
	(3.27)	(3.21)	(1.64)	(3.50)	(0.24)
LEV	0.105	0.107*	0.118	0.185**	0.392***
	(1.64)	(1.67)	(1.55)	(2.21)	(3.14)
INV_INT_COV	−0.123**	−0.128**	−0.084	−0.120**	−0.212
	(−1.97)	(−2.05)	(−1.05)	(−2.00)	(−1.15)
EXT_FIN_DEMAND	−0.222	−0.237	0.072	−0.100	0.102
	(−1.09)	(−1.16)	(0.32)	(−0.47)	(0.19)
SALEGR	0.017	0.016	0.061	−0.033	0.126

(continued on next page)

TABLE 4 (continued)

	(1) Full Sample (2002–2010) *ABFEE = ABFEE1* Coeff. (z-stat.)	(2) Full Sample (2002–2010) *ABFEE = ABFEE1* Coeff. (z-stat.)	(3) Non-Accelerated Filers and Small Accelerated Filers (Market Cap < $250M) (2002–2010) *ABFEE = ABFEE1* Coeff. (z-stat.)	(4) Accelerated Filers Only (2002–2010) *ABFEE = ABFEE1* Coeff. (z-stat.)	(5) Non-Accelerated Filers under Mandatory 404(a) and Small Accelerated Filers (Market Cap < $250M) (2007–2010) *ABFEE = ABFEE3* Coeff. (z-stat.)
	(0.46)	(0.44)	(1.47)	(−0.76)	(1.61)
BM	0.103**	0.102**	0.059*	0.093***	0.200*
	(2.51)	(2.48)	(1.92)	(2.63)	(1.87)
BIG4	−0.250**	−0.251**	−0.153	−0.247**	−0.306
	(−2.08)	(−2.09)	(−1.04)	(−2.47)	(−0.95)
SPECIALIST	0.037	0.035	−0.085	0.023	0.016
	(0.36)	(0.35)	(−0.50)	(0.26)	(0.04)
LOGTENURE	0.164***	0.163***	0.190***	0.131***	0.267*
	(3.56)	(3.52)	(3.07)	(3.59)	(1.94)
OFFICESIZE	0.040	0.041	0.002	0.060**	0.043
	(1.29)	(1.31)	(0.06)	(2.33)	(0.44)
Pseudo R^2	0.100	0.101	0.113	0.104	0.111
n	21,516	21,516	10,101	16,490	3,095
Test of Coefficients					
*ABFEE + ABFEE * LARGE = 0*					
z-stat.		−1.42	0.95		
(p-value)		(0.157)	(0.341)		
*ABFEE + ABFEE * LARGE + ABFEE * TEST404B = 0*					
z-stat.		−4.79***	−3.29***		
(p-value)		(0.000)	(0.001)		
*ABFEE + ABFEE * TEST404B = 0*					
z-stat.				−6.08***	−3.23***
(p-value)				(0.000)	(0.001)

***, **, * Denote two-tailed significance at the 1 percent, 5 percent, and 10 percent levels, respectively.
Columns (1) and (2) are estimated using the full sample. Column (3) is estimated using observations for all non-accelerated filers and small accelerated filers. A firm is classified as a small accelerated filer if the market valuation of common equity at the end of the current year is between $75 and $250 million, and the firm was in compliance with 404(b) for at least one year during the sample period. Column (4) is estimated using observations for accelerated filers only. A firm is classified as an accelerated filer if it was in compliance with 404(b) for at least one year during the sample period. Column (5) is estimated using non-accelerated filers in compliance with 404(a) and small accelerated filers in compliance with 404(b) during 2007–2010. The z-statistics are calculated based on robust standard errors clustered by firm. *ABFEE1* is abnormal audit fees calculated as the residuals estimated from the regressions in Column (1) of Table 2. *ABFEE3* is abnormal audit fees calculated as the residuals of the audit fee regression estimated for only non-accelerated filers and small accelerated filers with *TEST404B* in the model. *RESTK* equals 1 if the current-year annual report is subsequently restated, 0 otherwise. *TEST404B* equals 1 if the auditor issues an opinion on the effectiveness of the client's internal control over financial reporting in compliance with 404(b) for the current year, 0 otherwise. *LARGE* equals 1 if the market valuation of common equity equals or exceeds $75 million, 0 otherwise. See Appendix A for variable definitions.

when we partition the sample into $ABFEE > 0$ and $ABFEE < 0$, the coefficient for *TEST404B* is −4.67 (z = −3.75) and the marginal effect of *TEST404B* is a 2.4 percent reduction in the subsample with $ABFEE > 0$, and the coefficient for *TEST404B* is −0.067 (z = −0.50) and the marginal effect is a 0.4 percent reduction in the subsample with $ABFEE < 0$. These results clearly demonstrate that the effect of control testing (*TEST404B*) depends on abnormal audit fees.

Further sensitivity tests. Because mandated 404(b) is based on firm size, there remains a concern about the confounding effects of firm size, even though results are not sensitive to including *LARGE* and *ABFEE * LARGE* in Model (1). To further control for firm size, we re-estimate the model using only observations for non-accelerated and smaller accelerated filers

FIGURE 1
Internal Control Testing, Abnormal Audit Fees, and the Probability of Restatements
Full Sample

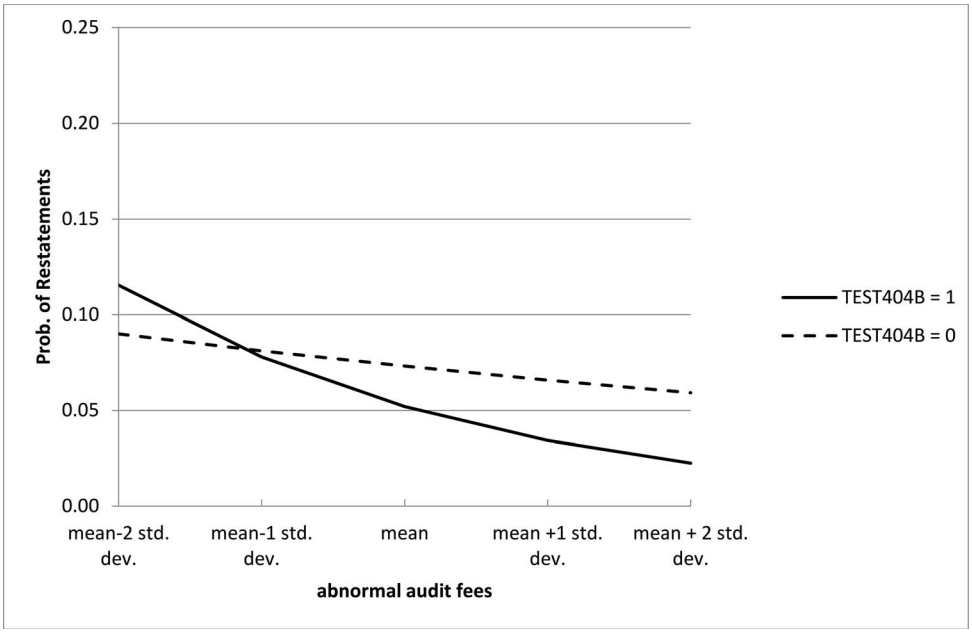


Figure 1 illustrates the significant interaction of *ABFEE* and *TEST404B* shown in Table 4, Column (2). It plots the predicted probability of an annual report restatement at five levels (the mean, and one and two standard deviations above/below the mean) of abnormal audit fees for observations with (solid line) and without (dashed line) mandatory internal control testing under SOX 404(b).

(market capitalization under $250 million). Results presented in Column (3) show that the coefficient of *ABFEE* ∗ *TEST404B* remains negative and significant ($p < 0.01$). We further address potential confounding effects of firm size, sample composition, and regulatory regime by re-estimating Model (1) using only accelerated filers. Results in Column (4) show that *ABFEE* ∗ *TEST404B* remains negative and significant ($p < 0.05$) when using accelerated filers before 404(b) as their own control group. To further reduce the effects of firm size on abnormal audit fees, we estimate abnormal audit fees separately for accelerated and non-accelerated filers. Untabulated results indicate that the *ABFEE* ∗ *TEST404B* coefficient remains negative and significant ($p < 0.05$). These results contribute to the literature by showing across numerous specifications that restatement likelihood incrementally declines for each unit of audit effort under 404(b), relative to other regimes.[28,29] Untabulated results are similar when we substitute *ABFEE2* for *ABFEE1*.

Test of H1b. To test H1b on the benefits of 404(b) relative to the 404(a)-only regime, we use non-accelerated filers with fiscal years ending after November 15, 2007 (the effective date of 404(a) for those firms) and smaller accelerated filers with market capitalization below $250 million during the same period. To allow for the possibility that audit fees for smaller firms are determined differently from larger firms (Chaney, Jeter, and Shivakumar 2004), we re-estimate abnormal audit fees (*ABFEE3*) based on this subsample alone.[30] Results in Column (5) show that the *ABFEE* ∗ *TEST404B* coefficient remains negative and significant ($p < 0.01$). This result is robust to all the following (not tabled) alternative restrictions imposed to

[28] To account for the possibility that 404(b) compliance fundamentally changed the audit fee determination process, we separately estimate abnormal audit fees for firms with and without control testing. The untabulated coefficient for *ABFEE* ∗ *TEST404B* remains negative and significant ($p < 0.01$).

[29] There are 695 observations for firms that voluntarily comply with SOX 404(b). To assess whether voluntary compliance achieves similar effect as mandatory compliance, we set *TEST404V* to 1 for voluntary compliance observations, 0 otherwise, and supplement Model (1) with *TEST404V* and *ABFEE* ∗ *TEST404V*. The coefficient for *ABFEE* ∗ *TEST404V* is insignificant ($z = 1.07$), whereas the coefficient for *ABFEE* ∗ *TEST404B* remains negative and significant ($z = -2.92$), suggesting voluntary compliance firms in our sample do not obtain the same benefits from control testing as the mandatory compliance firms, possibly due to the self-selection of firms that voluntarily comply with 404(b). When we delete the 695 observations for firms voluntarily complying with 404(b) from the sample. The *ABFEE* ∗ *TEST404B* coefficient in Model (1) remains negative and significant ($p < 0.01$).

[30] Results are not sensitive to alternative *ABFEE* measures. The coefficient on *ABFEE* ∗ *TEST404B* is −1.047 ($z = -3.23$) and −0.891 ($z = -2.85$) when we use *ABFEE1* and *ABFEE2*, respectively, in Table 4, Column (5).

create subsamples of accelerated and non-accelerated filers with more comparable size: (1) remove non-accelerated filers with market capitalization less than $50 million; (2) remove both non-accelerated filers with market capitalization less than $50 million and small accelerated filers with market capitalization greater than $200 million; and (3) remove both non-accelerated filers with market capitalization in the bottom quartile and small accelerated filers with market capitalization in the top quartile of this subsample.[31,32] These results suggest that the knowledge gained from management testing under 404(a) only is not as useful as auditor testing under 404(b) in reducing misstatements.[33,34]

Among control variables, *RESTK* is positively associated with *LARGE* (Lennox and Li 2014) ($p < 0.01$), *RESTPRIOR* (Lobo and Zhao 2013; Lennox and Li 2014) ($p < 0.01$), *BM* ($p < 0.1$), and *LOGTENURE* (Czerney, Schmidt, and Thompson 2014) ($p < 0.1$).

Test of H2: Variation in Auditing Standards (AS2 versus AS5)

H2 is a non-directional hypothesis on differences in the association of abnormal effort with misstatement reduction of 404(b) audits between the full-scope control testing of process controls under AS2 and the reduced-scope control testing under AS5's top-down approach. We test for a shift in the *ABFEE* coefficient from the AS2 to AS5 regime in the subsample of observations under 404(b). In Table 5, *AS5* equals 1 for fiscal years ending on or after November 15, 2007 (the effective date of AS5), 0 otherwise. The *ABFEE* ∗ *AS5* coefficient captures the incremental misstatement reduction during the AS5 regime relative to the AS2 regime. The *ABFEE* ∗ *AS5* coefficient is insignificant, suggesting that the benefits in the pre- and post-AS5 periods are comparable. Untabulated results are similar when we substitute *ABFEE2* for *ABFEE1*. The result implies that the benefits to audit planning of knowledge gained from ICFR testing are similar with limited-scope control testing under AS5 versus full-scope testing under AS2.[35]

Tests of H3a and H3b: Variation in the Auditor-Client Relationship and Audit Firm Size

H3a predicts that information gained from incremental 404(b) auditor testing might provide the greatest benefit in the early years of auditor tenure. To investigate, we partition the sample into short (fewer than three years), medium (three to nine years), and long tenure (more than nine years), and re-estimate Model (1) in these subsamples. Model results are presented in Table 6, Columns (1)–(3), and predicted probabilities are shown in Figure 2, Panels A–C. Among short-tenure observations (Table 6, Column (1)), the *ABFEE* ∗ *TEST404B* coefficient is negative and significant ($p < 0.01$) and the main effect for *TEST404B* is insignificant. Figure 2, Panel A confirms that 404(b) is associated with lower misstatement probability only when abnormal fees exceed the mean. When abnormal fees are very low, misstatement likelihood is actually considerably higher for 404(b) relative to non-404(b) observations. That situation represents considerable difficulties for the auditor because accelerated filer clients are relatively large and complex, pre-engagement knowledge of their systems and circumstances is lacking, and the current audit has below average resources to perform sufficient testing to uncover any potential misstatements. As abnormal fees rise under 404(b), this deficit is overcome and misstatement rates are driven steadily lower. Meanwhile, abnormal effort has no effect on misstatement likelihood for short-tenure non-404(b) audits, implying that additional audit work performed does not assist in misstatement reduction.

For medium-tenure observations (Table 6, Column (2)), the *ABFEE* ∗ *TEST404B* coefficient is negative and significant but weaker than in Column (1) ($p < 0.10$),[36] and the main effect for *TEST404B* is negative and significant ($p < 0.05$). Figure 2, Panel B shows that misstatement likelihood continues to decline under 404(b) with higher abnormal fees, suggesting a benefit

[31] We drop *LARGE* and *ABFEE* ∗ *LARGE* from the regressions in Table 4, Column (5) because most accelerated filers have already been in compliance with mandatory 404(b) after 2007. The *ABFEE* ∗ *TEST404B* coefficient is negative and significant ($p < 0.01$) if we include *LARGE* and *ABFEE* ∗ *LARGE* in Columns (5).

[32] The VIFs of our variable of interest (*ABFEE* ∗ *TEST404B*) are 2.55, 1.98, 2.53, and 1.63 in Columns (2) through (5) of Table 4, respectively. The highest VIF among all control variables equals 5.51 for *ABFEE* ∗ *LARGE* in Column (2), implying multicollinearity is not a serious concern (Belsley, Kuh, and Welsch 1980) for our core results. Results are not sensitive to clustering standard errors by both firm and year, to allow for residual correlations among different firms in the same year and different years in the same firm.

[33] We also investigate the difference between SOX404(b) versus SOX 302 regimes, and the difference between SOX 404(b) and SOX 404(a)-only regimes by partitioning the full sample into the 2002–2006 period and the 2007–2010 period and re-estimate Model (1). The *TEST404B* ∗ *ABFEE* coefficient is −0.306 ($p < 0.05$) and −0.603 ($p < 0.05$) for the 2002–2006 and 2007–2010 periods, respectively.

[34] As a sensitivity test, we replace *MW302* with *MW,* which equals 1 if the firm discloses material weakness in internal control under SOX 302, SOX 404(a), or SOX 404(b), 0 otherwise, and re-estimate the regression in Column (2) of Table 4. The untabulated results are similar to the main analysis using *MW302*. The coefficient for *MW* is positive and significant at the 1 percent level, and the coefficient for our test variable *ABFEE* ∗ *TEST404B* remains negative and significant at the 1 percent level, suggesting our main result is not sensitive to including this measure of material weakness in internal control.

[35] We find that the coefficient for *ABFEE* ∗ *AS5* continues to be insignificant when we estimate abnormal audit fees within the subsample of firms in compliance with 404(b), regardless of whether we include or exclude *AS5* in the audit fee regression model.

[36] Chi-squared tests at the bottom of Table 6 suggest that the *ABFEE* ∗ *TEST404B* coefficient is more negative in the short-tenure sample than in the medium- and long-tenure samples ($p < 0.10$).

TABLE 5

The Effects of AS5 on Prevention of Annual Report Misstatements under SOX 404(b)

Sample	(1) Observations with *TEST404B* = 1 *ABFEE* = *ABFEE1*
Intercept	−3.353***
	(−6.61)
ABFEE	−0.380***
	(−3.56)
AS5	−0.143
	(−0.55)
ABFEE ∗ *AS5*	−0.150
	(−0.84)
Controls	Included
Pseudo R^2	0.077
n	10,944
Test of Coefficients	
ABFEE + *ABFEE* ∗ *AS5* = 0	
z-stat.	−3.27***
(p-value)	(0.001)

*** Denote two-tailed significance at the 1 percent level.
This table reports the results using only firms under mandatory compliance with 404(b). *AS5* equals 1 for fiscal years ending on or after November 15, 2007, 0 otherwise. The z-statistics are calculated based on robust standard errors clustered by firm. The control variables are the same as those presented in Table 4 and are omitted for brevity.
See Appendix A for variable definitions.

of incremental knowledge gained from control testing in the current-year audit. Abnormal effort again has no effect on misstatement likelihood for non-404(b) audits.

For long-tenure observations (Table 6, Column (3)), model results show a negative and significant main effect for *TEST404B* ($p < 0.05$) and an insignificant interaction term. Consistent with these tests, Figure 2, Panel C shows that the difference in the likelihood of misstatements is similar across the range of abnormal fees; i.e., predicted probabilities are lower throughout for 404(b) observations than for non-404(b) observations. The insignificant slopes of the 404(b) and non-404(b) engagements and the lack of difference in the slopes imply that the benefit of 404(b) in the current year does not depend on abnormal audit fees. Collectively, results of the tenure partitions suggest that the benefit of 404(b) depends most on greater audit effort during the first two years of an engagement, when the auditor lacks knowledge of the client's systems and accounting practices. The contribution of greater current-year audit effort under 404(b) sharply diminishes as tenure increases. When tenure exceeds ten years, the benefit of 404(b) is realized even when abnormal fees are low.

H3b examines whether Big 4 or non-Big 4 auditors gain more value from knowledge derived from incremental 404(b) testing. To investigate, we re-estimate Model (1) in subsamples of *BIG4* and non-*BIG4* engagements separately. Model results are presented in Table 6, Columns (4)–(5), and predicted probabilities are shown in Figure 2, Panel D and Panel E. Table 6, Column (4) shows that the *ABFEE* ∗ *TEST404B* coefficient for *BIG4* auditors is negative and significant ($p < 0.05$), as is the main effect for *TEST404B* ($p < 0.01$). Predicted probabilities in Figure 2, Panel D show that for these largest audit firms, misstatement likelihood is lower under 404(b) throughout the range of abnormal audit fees, and the benefit of incremental effort in misstatement reduction is greater under 404(b). In contrast, for non-*BIG4* auditors, Table 6, Column (5) shows that the *ABFEE* ∗ *TEST404B* coefficient is negative and significant ($p < 0.05$) and the main effect for *TEST404B* is insignificant. Figure 2, Panel E shows no benefit to 404(b) testing for non-Big 4 firms below the midpoint of abnormal audit fees; this benefit is only gained when fees are higher than the mean, suggesting sufficient resources are needed to understand client controls. As abnormal fees go below the mean, misstatement likelihood quickly rises. Taken together, these results imply that constrained audit fees are especially problematic when non-Big 4 firms audit the large, complex accelerated filers. We obtain similar results for H3a and H3b when we substitute *ABFEE2* for *ABFEE1* (untabulated).

In addition to testing H3a and H3b, we also consider possible differences in audit quality associated with auditor industry specialization (Reichelt and Wang 2010). Specifically, we investigate whether the benefits of control testing differ between

TABLE 6

Auditor Characteristics Associated with Variation in the Benefit of Mandatory SOX 404(b)

Panel A: Auditor Tenure and Auditor Size

	Sample				
	(1) Observations with Tenure < 3 (2002–2010) *ABFEE = ABFEE1*	(2) Observations with Tenure = 3–9 (2002–2010) *ABFEE = ABFEE1*	(3) Observations with Tenure ≥ 10 (2002–2010) *ABFEE = ABFEE1*	(4) Observations with *Big4* = 1 (2002–2010) *ABFEE = ABFEE1*	(5) Observations with *Big4* = 0 (2002–2010) *ABFEE = ABFEE1*
Intercept	−4.286***	−4.170***	−4.127***	−4.422***	−4.687***
	(−7.04)	(−10.08)	(−7.98)	(−12.71)	(−8.53)
ABFEE	0.022	−0.023	−0.007	−0.259	0.191
	(0.11)	(−0.13)	(−0.03)	(−1.48)	(1.11)
TEST404B	−0.187	−0.255**	−0.381**	−0.322***	−0.227
	(−0.81)	(−2.13)	(−2.28)	(−2.91)	(−1.21)
*ABFEE * TEST404B*	−0.748***	−0.300*	−0.203	−0.270**	−0.673**
	(−2.67)	(−1.95)	(−1.04)	(−2.08)	(−2.45)
LARGE	0.288	0.630***	0.774***	0.645***	0.363**
	(1.35)	(4.47)	(4.13)	(4.92)	(2.02)
*ABFEE * LARGE*	−0.099	−0.114	−0.065	0.105	−0.102
	(−0.41)	(−0.54)	(−0.24)	(0.57)	(−0.38)
CONTROLS	Included	Included	Included	Included	Included
Pseudo R^2	0.123	0.116	0.099	0.102	0.123
n	3,670	11,190	6,656	15,971	5,545
Test of Coefficients					
*ABFEE + ABFEE * LARGE = 0*					
z-stat.	−0.52	−1.21	−0.49	−2.52**	−1.45
(p-value)	(0.603)	(0.226)	(0.621)	(0.012)	(0.146)
*ABFEE + ABFEE * LARGE + ABFEE * TEST404B = 0*					
z-stat.	−3.44***	−3.67***	−2.01**	−3.84***	−3.23***
(p-value)	(0.000)	(0.000)	(0.044)	(0.000)	(0.001)
Tests of Coefficient Equality across Sample Partitions					
$ABFEE * TEST404B_{SHORT} = ABFEE * TEST404B_{MEDIUM}$					
z-stat.		−1.70*			
(p-value)		(0.089)			
$ABFEE * TEST404B_{SHORT} = ABFEE * TEST404B_{LONG}$					
z-stat.			−1.72*		
(p-value)			(0.085)		
$ABFEE * TEST404B_{NONBIG4} = ABFEE * TEST404B_{BIG4}$					
z-stat.					−2.09**
(p-value)					(0.037)

(continued on next page)

clients of specialist and non-specialist auditors. Results in Table 6, Panel B indicate that the coefficient on *ABFEE * TEST404B* is negative and significant at $p < 0.05$ or better for both specialist and non-specialist auditors. The coefficient magnitudes indicate that specialist auditors experience greater improvement than non-specialist auditors as abnormal effort increases. This is consistent with specialist auditors gaining more valuable knowledge from internal control audits and/or being more capable at applying such insights in auditing the financial statements.

Additional Analyses

In additional analyses, we consider the effect of internal control material weaknesses (MWs) and the nature of misstatements. Given that control weaknesses significantly increase misstatement risk (Doyle et al. 2007), we expect that the

TABLE 6 (continued)

Panel B: Auditor Industry Expertise

	Sample	
	(1) Observations with *SPECIALIST* = 1 (2002–2010) *ABFEE* = *ABFEE1*	**(2) Observations with *SPECIALIST* = 0 (2002–2010) *ABFEE* = *ABFEE1***
Intercept	−5.277***	−4.163***
	(−6.01)	(−14.72)
ABFEE	−0.619	−0.011
	(−1.50)	(−0.09)
TEST404B	−0.721**	−0.205**
	(−2.42)	(−2.15)
ABFEE ∗ *TEST404B*	−0.927***	−0.246**
	(−3.22)	(−2.02)
LARGE	1.243***	0.546***
	(3.50)	(5.03)
ABFEE ∗ *LARGE*	0.673	−0.141
	(1.50)	(−0.97)
Controls	Included	Included
Pseudo R^2	0.156	0.099
n	2,206	19,310
$ABFEE * TEST404B_{SPECIALIST} = ABFEE * TEST404B_{NONSPECIALIST}$		
χ^2	5.20**	

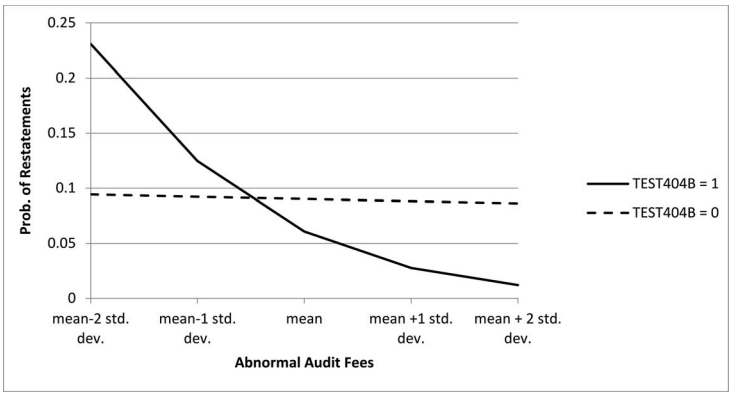
***, **, * Denote two-tailed significance at the 1 percent, 5 percent, and 10 percent levels, respectively.
Panel A, Columns (1) through (3) report the results for subsamples with short auditor tenure (< 3 years), medium auditor tenure (3–9 years), and long auditor tenure (≥ 10 years), respectively. Columns (4) and (5) report the results for clients of Big 4 auditors and non-Big 4 auditors, respectively. Panel B, Columns (1) and (2) report the results for subsamples with industry-specialist auditors (*SPECIALIST* = 1) and non-industry-specialist auditors (*SPECIALIST* = 0). The z-statistics are calculated based on robust standard errors clustered by firm. The control variables are the same as those presented in Table 4, Column (2) and are omitted for brevity.
See Appendix A for variable definitions.

knowledge gained from 404(b) audits might be particularly helpful in directing auditor effort at firms with material weakness in internal controls. To investigate, we estimate Model (1) in subsamples of firms with and without SOX 302 MWs. In untabulated results, the *ABFEE* ∗ *TEST404B* coefficient is insignificant for firms with clean SOX 302 reports, but is negative and significant ($p < 0.01$) for firms with SOX 302 MWs, with the latter significantly more negative than the former. We find similar results when partitioning the sample based on MW disclosure under 404(a). This evidence suggests that the increased benefits in misstatement reduction from greater audit effort under 404(b) control audits primarily occur in firms with ineffective controls and thus greater misstatement risk. Although such firms tend to be smaller, younger, financially weaker, and therefore less able to afford the costs of control audits, they may also derive greater benefit.

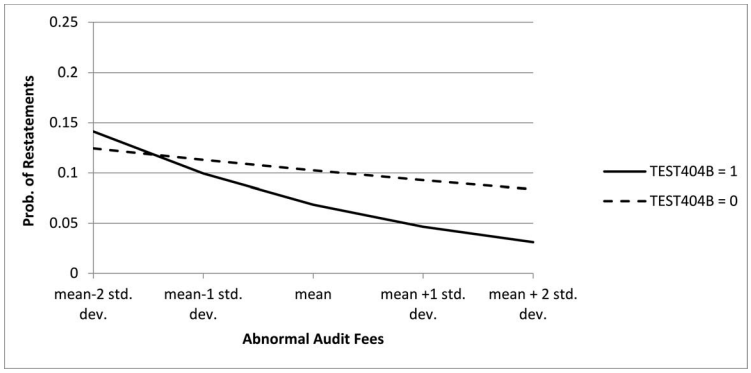
Furthermore, prior research reports that core accounts are more subject to management manipulation (McVay 2006), and restatements of core accounts trigger more negative market reactions and lead to higher auditor litigation risk relative to restatements of non-core accounts (Palmrose, Richardson, and Scholz 2004; Palmrose and Scholz 2004). To investigate, we follow prior literature (Palmrose and Scholz 2004) in classifying restatements as related to core (*RESTK_CORE*) or non-core accounts (*RESTK_NONCORE*). We estimate Model (1) using the 1,113 core-account restatements and 676 noncore-account restatements, respectively, with 19,727 observations without annual report restatements serving as the reference group in the regression. The *ABFEE* ∗ *TEST404B* coefficient is negative and significant ($p < 0.01$) when *RESTK_CORE* is the dependent variable, insignificant when *RESTK_NONCORE* is the dependent variable, and the difference between the two coefficients is significant ($p < 0.05$). Thus, the benefits of incremental auditor effort under 404(b) accrue to accounts affecting core earnings and routine, recurring transactions, in which misstatements have more severe capital market and legal consequences.

FIGURE 2
Predicted Probability of Restatement at Different Levels of Abnormal Audit Fees for 404(b) and Other Audits in Subsamples Partitioned by Auditor Tenure and Auditor Size

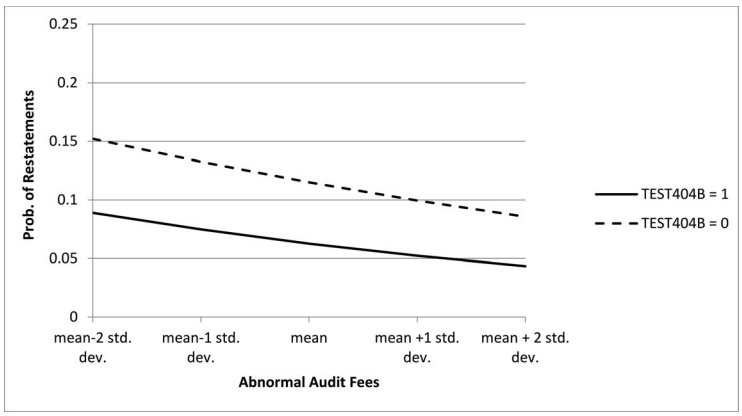
Panel A: Short-Tenure Subsample



Panel B: Medium-Tenure Subsample



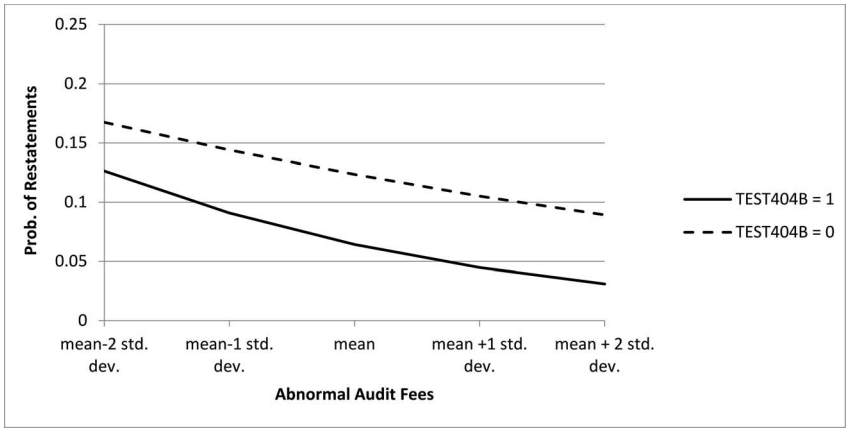
Panel C: Long-Tenure Subsample



(continued on next page)

FIGURE 2 (continued)

Panel D: Big N Auditor Subsample



Panel E: Non-Big N Auditor Subsample

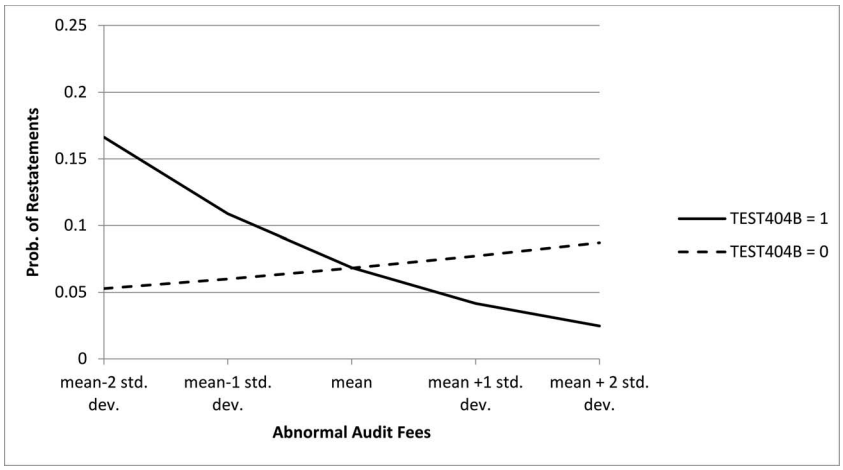


Figure 2, Panels A–E illustrate the significant interactions of *ABFEE* and *TEST404B* shown in Table 6, Panel A, Columns (1)–(5), respectively. These figures plot the predicted probability of an annual report restatement at five levels (the mean, and one and two standard deviations above/below the mean) of abnormal audit fees for observations with (solid line) and without (dashed line) mandatory internal control testing under SOX 404(b).

Robustness Tests

We conduct additional untabulated analyses to examine the robustness of our baseline Model (1) results to the effect of correlated omitted variables, sample composition, alternative explanations, and econometric issues.[37]

Correlated Omitted Variables

Accelerated filers and non-accelerated filers may differ along dimensions other than those controlled in Model (1). Potential correlation between uncontrolled firm characteristics and *RESTK* and *ABFEE* could bias coefficient estimates (Wooldridge 2002). To construct a sample in which accelerated filers more closely resemble non-accelerated filers, we identify 116 firms that moved from non-accelerated to accelerated status during the sample period by surpassing the $75 million market

[37] We report all sensitivity tests using *ABFEE1*, but the results are qualitatively similar using *ABFEE2*.

value threshold. We then estimate Model (1) for these firms for two years before and after their initial 404(b) compliance (464 observations). Since firm characteristics usually do not change substantially within a short window, the correlated omitted variables problem is less likely to influence these results. Results show that *ABFEE* ∗ *TEST404B* is negative and significant ($p < 0.05$). In an alternative way to control for potential estimation bias induced by omitted time-invariant firm characteristics, we estimate Model (1) using a firm fixed-effects regression, which explores within-firm differences. This procedure involves eliminating 16,115 observations for firms without variation in the dependent variable. The *ABFEE* ∗ *TEST404B* coefficient remains negative and significant ($p < 0.01$).

Alternative Explanations

To mitigate the concern that our main results might be due to auditor changes among accelerated filers after 404(b) implementation, we remove all accelerated filers that switched auditors during the sample period and re-estimate Model (1). The *ABFEE* ∗ *TEST404B* coefficient remains negative and significant ($p < 0.05$). To control for the effects of SEC-imposed 10-K filing acceleration on restatement likelihood (Doyle and Magilke 2012), we further control for annual report lag, measured as the natural logarithm of the number of days between fiscal year-end and 10-K filing date. In Model (1), the *ABFEE* ∗ *TEST404B* coefficient remains negative and significant ($p < 0.01$), whereas the coefficient for annual report lag is insignificant. Although above we note numerous methods to control for the potentially confounding effect of firm size, we also use propensity score matching (PSM) to create a more homogenous sample of accelerated and non-accelerated filers. Our objective is not to model the choice of having a SOX 404(b) audit (which is exogenously imposed on firms by regulatory requirements), but to assemble a treatment and a control subsample with similar firm characteristics to further alleviate the concern that results in our main regression are caused by differences in observable characteristics between the treatment and control firms. Within a sample of 1,078 matched pairs, the coefficient on *ABFEE* ∗ *TEST404B* remains negative and significant ($p < 0.05$).

Sample Composition

To ensure that our main results are not driven by changes in accelerated filer population, we construct a sample of accelerated filers with two years of data both before and after 404(b); thus, four observations for each accelerated filer. Using this balanced panel, we re-estimate Model (1), finding that the *ABFEE* ∗ *TEST404B* coefficient is negative and significant ($p < 0.05$).

Other Research Design Issues

We perform additional tests to address several econometric issues associated with our research design. First, Ai and Norton (2003) note that interaction coefficients in logit and probit models may not have the same sign or significance as the cross-partial with respect to the probability of the dependent variable. Following their procedure, we plot z-statistics for *ABFEE* ∗ *TEST404B* for each individual observation in Model (1) and find they are all negative with a mean of −2.35 (untabled). Second, we relax the coefficient equality restrictions for control variables between 404(b) and non-404(b) firms by including interaction terms between *TEST404B* and all the other independent variables in Model (1). The *ABFEE* ∗ *TEST404B* coefficient remains negative and significant ($p < 0.01$). Third, to more rigorously control for the concurrent change in audit efficiency of non-accelerated filers from the pre- to post-2004 period, we set *POST* to 1 for fiscal year 2004 and thereafter, 0 otherwise, and supplement Model (1) with *POST* and *ABFEE* ∗ *POST*. The *ABFEE* ∗ *POST* coefficient is insignificant, suggesting no change in the benefits of abnormal audit effort for non-accelerated filers after 2004. In contrast, the *ABFEE* ∗ *TEST404B* coefficient is negative and remains significant ($p < 0.05$). Fourth, although we include a comprehensive set of control variables and year indicators to control for the steady decline in restatement likelihood during the sample period, we may not appropriately control for all factors causing this decline. To address this concern, we estimate Model (1) for 2004 only when the restatement likelihood is quite high for both accelerated and non-accelerated filers. The *ABFEE* ∗ *TEST404B* coefficient remains negative and significant ($p < 0.05$).[38]

[38] To further control for potential differential in audit quality during the financial crisis, in untabulated analysis we set the indicator *CRISIS* equal to 1 for years 2007–2010 (0 otherwise), and include both *CRISIS* and its interaction term *ABFEE* ∗ *CRISIS* in the regression. To avoid duplicated controls for years, we drop all the year indicator variables from the regression. We then re-estimate Columns (2)–(4) in Table 4. The coefficient for *CRISIS,* which captures the incremental restatement probability during the financial crisis period relative to non-financial crisis period for firms with zero abnormal audit fees, is negative and significant at the 1 percent level across all columns, consistent with the general reduction in annual report restatement frequency during 2007–2010, as documented in Panel C of Table 3. The interaction term *ABFEE* ∗ *CRISIS* is insignificant, suggesting no changes in the reduction of restatement probability per unit of abnormal audit fees during the financial crisis period for observations not in compliance with SOX 404(b). More importantly, the coefficient for *ABFEE* ∗ *TEST404B* remains negative and significant at the 10 percent level or better, consistent with main results in the paper. Overall, this additional analysis indicates that our results are robust to considering the effect of the financial crisis on audit quality.

CONCLUSIONS

More than ten years after the passage of SOX, it remains unclear whether auditor internal control testing under 404(b) leads to better financial reporting quality relative to less-costly alternative internal control regimes and, if so, under what circumstances financial reporting improvements are garnered. We propose that the financial reporting improvements arising from control testing under 404(b) should increase with auditor effort. We further suggest that the benefits of greater effort under 404(b) are not uniform, but rather are greater under conditions where auditors' knowledge of the client's control structure can be better acquired and used. We investigate this issue in the context of auditors' prevention of financial reporting misstatements, as shareholders suffer significant losses from restatements (Palmrose et al. 2004; Hennes, Leone, and Miller 2008; Burks 2011). In so doing, we build on prior research by Nagy (2010), who finds that 404(b) control testing on average reduced financial misstatements in the year following implementation of this regime.

Our results show that overall, the benefit of 404(b) in reducing misstatements is in fact dependent on engagement resources (i.e., at or above the mean of abnormal audit fees). In fact, at low levels of abnormal fees, there is no incremental benefit of 404(b) testing over other internal control regimes. This implies that when fees are constrained, the auditor has difficulty leveraging knowledge gained from control testing to plan an effective and efficient audit. This finding has implications for audits in which clients place strong downward pressure on fees (Christensen, Omer, Sharp, and Shelley 2014; Ettredge, Fuerherm, and Li 2014). Further, under 404(b) the likelihood of a misstatement steadily and significantly declines with audit effort, while under alternative regimes there is generally no incremental benefit in misstatement reduction when audit effort increases. The effect of 404(b) on misstatement reduction (robust to a number of sensitivity analyses) applies when 404(b) engagements are compared to all other regimes, 404(a)-only engagements, or the subsample of accelerated filer companies prior to implementation of 404(b). It is especially important that we fail to find evidence that 404(a) (only) effectively substitutes for 404(b). This may suggest lower control testing quality by management, auditor reluctance to rely on management's work, or a combination of the two.

Our main finding defines sufficient resources as one key condition for 404(b) testing to provide sufficient knowledge to benefit audit quality. We further extend our testing to investigate other situations in which the extent or usefulness of the knowledge gained from auditor control testing might differ. Regarding the scope of internal control audits, we find that the association between abnormal audit fees and misstatement reduction does not differ between the AS2 and AS5 regimes. This result suggests that the greater testing of control processes under AS2 might not have provided incremental knowledge beneficial in directing audit testing, as long as entity-level controls are tested under the AS5 rules. Focusing on the auditor-client relationship, we document that incremental auditor effort under 404(b) is most beneficial to engagements with shorter auditor tenure, where client-specific knowledge is not as well developed. This result provides an interesting policy implication, suggesting that rather than imposing internal control regulations based on issuer size, regulators might consider mandating control testing only during the early years of auditor tenure.[39]

Further, we find that while incremental audit effort under 404(b) is associated with misstatement reduction for both Big 4 and non-Big 4 auditors, the association is stronger for non-Big 4 engagements. Apparently, when non-Big 4 firms audit the larger, more complex accelerated filers, they need additional effort beyond the normal level in order to achieve an incremental benefit from 404(b) in misstatement reduction.

While we demonstrate the link between incremental engagement effort and one measure of audit quality under SOX 404(b), this study is limited in that we do not examine other potential benefits, and our findings may not generalize to other benefits. Future research should examine alternative benefit measures. For example, given that SOX 302 quarterly internal control disclosures provide investors more timely update on the effectiveness of ICFR than SOX 404 disclosures, future research could examine whether the accuracy of SOX 302 disclosures differs between firms with and without mandatory internal control audits. Such endeavor will shed more light on this important policy debate from a broader perspective.

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[39] A potential unintended outcome of this recommendation is reduced auditor switches to avoid increased fees associated with control testing by auditors.

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APPENDIX A

Variable Definitions

Variables		Description (Compustat mnemonics in parentheses)
Dependent Variables		
RESTK	=	1 if the current-year annual report is subsequently restated, 0 otherwise.
Test Variables		
TEST404B	=	1 if the auditor issues an opinion on the effectiveness of the client's internal control over financial reporting in mandatory compliance with Section 404(b) of SOX for the current year, 0 otherwise.
Control Variables		
ABFEE1	=	abnormal audit fees estimated as the residuals of the audit fee regression including *TEST404B* in the model.

(continued on next page)

APPENDIX A (continued)

Variables		Description (Compustat mnemonics in parentheses)
ABFEE2	=	abnormal audit fees estimated as the residuals of the audit fee regression excluding *TEST404B* from the model.
LARGE	=	1 if the market valuation of common equity at end of the current year equals or exceeds $75 million ($PRCC_F_t * CSHO_t \geq$ $75 million), 0 otherwise.
MW302	=	1 if the client reports a material weakness in internal control over financial reporting pursuant to SOX 302 during any quarter for the current year, 0 otherwise.
F_SCORE	=	predicted probability of misstatements based on misstatements announced as of year *t*. We estimate this probability based on the misstatement detection model of Dechow et al. (2011, Table 7, Model (3)).
RESTPRIOR	=	1 if any annual or quarterly report of the prior two years (year $t-1$ or $t-2$) is restated and the restatement is announced before the end of the current fiscal year, 0 otherwise.
TA	=	natural log of total assets: $\ln(AT_t)$.
AGE	=	natural log of the number of years since the company's IPO.
NEG_EQUITY	=	1 if total liabilities are greater than total assets ($LT_t > AT_t$), 0 otherwise.
ROA	=	return on lagged total assets: (IB_t/AT_{t-1}).
LOSS	=	1 if net income is negative ($NI_t < 0$), 0 otherwise.
CURRENT_ACCRUAL	=	change in noncash current assets from year $t-1$ to t scaled by average total assets. [(ΔCurrent Assets − ΔCash and Short-Term Investments) − (ΔCurrent Liabilities − ΔDebt in Current Liabilities − ΔTaxes Payable)]/Average Total Assets. $((\Delta ACT_t - \Delta CHE_t) - (\Delta LCT_t - \Delta DLC_t - \Delta TXP_t))/((AT_t + AT_{t-1})/2)$.
MERGER	=	1 if the company had an acquisition that contributed to sales ($AQS_t > 0$), 0 otherwise.
FIN	=	1 if the sum of new long-term debt plus new equity exceeds 2 percent of lagged total assets $((DLTIS_t + SSTK_t)/(AT_{t-1}) >$ 2 percent), 0 otherwise.
LEV	=	total liabilities divided by total assets: (LT_t/AT_t).
INV_INT_COV	=	inverse interest expense coverage. It equals interest expense divided by operating income before depreciation: $XINT_t/OIBDP_t$. The ratio is capped at 2 and assigned a value of 2 if $OIBDP_t < 0$.
EXT_FIN_DEMAND	=	1 if *FREECASH* < -0.5, 0 otherwise. *FREECASH* is cash flows from operations minus average capital expenditure scaled by lagged current assets: ($OANCF_t$ − average $CAPX_t$)/ACT_{t-1}. Capital expenditures are averaged over the preceding three years ($t-3$ to $t-1$).
SALEGR	=	percentage change in sales from the prior year to the current year: $(SALE_t - SALE_{t-1})/(SALE_{t-1})$.
BM	=	book-to-market ratio at the end of the fiscal year: $(CEQ_t)/(PRCC\_F_t * CSHO_t)$.
BIG4	=	1 if the client is audited by a Big 4 accounting firm, 0 otherwise.
SPECIALIST	=	1 if in a particular year the accounting firm has the largest market share of audit fee revenue in the client's industry (by two-digit SIC code) and its market share is at least 10 percent greater than the second industry leader in the market, 0 otherwise.
LOGTENURE	=	natural log of the number of years the company is audited by the same audit firm.
OFFICESIZE	=	natural log of the number of total audit clients of an audit office.
Additional Variables Used in Audit Fee Prediction Model		
AUDFEE	=	natural logarithm of total audit fees for the current year.
SQSEG	=	square root of the total number of business segments of the firm.
PENSION	=	1 if the firm has a pension or retirement plan, 0 otherwise.
INV	=	inventory scaled by total assets: $(INVT_t/AT_t)$.
REC	=	accounts receivable scaled by total assets: $(RECT_t/AT_t)$.
ABRET	=	market-adjusted stock returns for the current fiscal year.
DEC	=	1 if the firm has a December fiscal year-end, 0 otherwise.
DELAY	=	natural logarithm of the number of days from fiscal year-end to the signature date of audit opinion.