Journal of Accounting and Economics 63 (2017) 358–384

Contents lists available at ScienceDirect

Journal of Accounting and Economics

journal homepage: www.elsevier.com/locate/jae

Benefits and costs of Sarbanes-Oxley Section 404(b) exemption: Evidence from small firms' internal control disclosures

Weili Ge [a], Allison Koester [b], Sarah McVay [a,*]

[a] Foster School of Business, University of Washington, United States
[b] McDonough School of Business, Georgetown University, United States

ARTICLE INFO

Article history:
Received 4 January 2016
Received in revised form
2 January 2017
Accepted 9 January 2017
Available online 21 March 2017

Keywords:
Internal controls over financial reporting
Regulation
Disclosure accuracy
Non-accelerated filers
Section 404

ABSTRACT

We quantify measurable benefits and costs of exempting firms from auditor oversight of internal control effectiveness disclosures. We measure the benefit of exemption as an aggregate $388 million in audit fee savings from 2007–2014. The costs stem from internal control misreporting: an aggregate $719 million of lower operating performance due to non-remediation and a $935 million delay in aggregate market value decline due to the failure to disclose ineffective internal controls. The audit fee savings benefit shareholders of all exempt firms, whereas the costs are borne by shareholders of only a fraction of exempt firms (the internal control misreporters).

1. Introduction

Despite a decade of research on the Sarbanes-Oxley Act of 2002 (SOX), the net benefits and costs of the regulation remain elusive (Coates and Srinivasan, 2014). The most costly and hotly debated provision of SOX is Section 404(b), which requires auditor oversight of the effectiveness of firms' internal control over financial reporting (hereafter internal controls). We investigate measurable benefits and costs of exempting firms from 404(b). Such an investigation is important for stakeholders of the more than five thousand firms currently exempt from this regulation (PCAOB, 2015). In addition, our investigation provides timely and useful information as Congress considers exempting additional firms (U.S. Congress, 2016a, 2016b).

Section 404(a) requires that management document, test, and assess the effectiveness of their firms' internal controls, and Section 404(b) requires that auditors provide an independent opinion on client firms' internal control effectiveness. Sections 404(a) and 404(b) became effective in 2004 for firms with a public float of at least $75 million. However, the high audit fees associated with implementation motivated the SEC to issue numerous deferrals for firms with public floats of less than $75 million (e.g., Palmrose, 2010; Kinney and Shepardson, 2011; Coates and Srinivasan, 2014). For these firms (hereafter "exempt firms"), the deferrals ultimately culminated in the implementation of 404(a) in 2007 and a permanent exemption from 404(b) in 2010.

We examine the measurable benefits and costs to shareholders that result from 404(b) exemption. Using audit fee savings as a proxy for the benefit of exemption, we compare the relative increase in audit fees of exempt firms and

* Corresponding author.
E-mail addresses: geweili@uw.edu (W. Ge), allison.koester@georgetown.edu (A. Koester), smcvay@uw.edu (S. McVay).

http://dx.doi.org/10.1016/j.jacceco.2017.01.001
0165-4101/

non-exempt firms from 2003 to 2014.[1] We attribute the 35.7 percent incremental increase in non-exempt firms' audit fees to 404(b) compliance.[2] If exempt firms had experienced this incremental 35.7 percent increase, the average exempt firm would have paid an additional $73,165 in annual audit fees from 2007 through 2014 (or an estimated $585,320 per firm; $73,165 × 8 years). Thus, exemption results in an aggregate of $388 million in 404(b)-related audit fee savings for the 5,302 exempt firm-years in our sample. This benefit accrues to shareholders of all exempt firms.

The key concern of exemption is that it leads to internal control misreporting (IC misreporting).[3] IC misreporting imposes at least two measurable costs on current and prospective shareholders: lower operating performance due to non-remediation and market values that fail to reflect a firm's underlying internal control status. Prior research finds that changes to external reporting affect managerial decision-making by changing managers' information sets (Shroff, 2017). Consistent with these findings, accounting information generated by effective internal control systems is more useful for managerial decision making, and firms that disclose and subsequently remediate ineffective internal controls experience an improvement in operating performance (Cheng et al., 2013; Feng et al., 2015). We examine changes in future earnings to infer whether firms experience lower operating performance stemming from non-remediation. Prior research also finds that investors react negatively to the disclosure of ineffective internal controls (Hammersley et al., 2008). We measure market values that fail to reflect a firm's underlying internal control status using future abnormal stock returns.

To identify IC misreporting, we estimate a prediction model of internal control effectiveness using non-exempt firms and apply the coefficients from this out-of-sample model to exempt firms. The prediction model explains 89 percent of the area under the ROC curve, indicating excellent discrimination (Hosmer and Lemeshow, 2000, p.162). We predict that 20.2 percent of exempt firms should disclose ineffective internal controls, whereas only 10.9 percent do so. Thus, we estimate that 9.3 percent of exempt firms (=20.2–10.9) disclose effective internal controls but maintain ineffective internal controls; we classify these firms as "suspected IC misreporters." Numerous tests validate our suspected IC misreporter classification.

We cannot assume that 404(b) compliance would fully curb IC misreporting, however, as prior research documents IC misreporting even among firms subject to Section 404(b) (e.g., Rice and Weber, 2012; Rice et al., 2015; DeFond and Lennox, 2017). To estimate the amount of IC misreporting that 404(b) would curb, we track 254 firms that reach the $75 million public float size threshold and switch from exempt to non-exempt status. We find that 38.1 percent of suspected IC misreporters disclose ineffective internal controls once they become subject to 404(b). This 38.1 percent serves as our estimate of how much 404(b) curbs IC misreporting, suggesting that 404(b) compliance would lower IC misreporting from 9.3 to 5.8 percent.

To assess the costs of IC misreporting we compare the future earnings and abnormal stock returns of exempt firms that disclose ineffective internal controls to those of suspected IC misreporters. Exempt firms that disclose ineffective internal controls experience a marked improvement in earnings in the three years following the disclosure, which we empirically link to the remediation of ineffective internal controls. In contrast, suspected IC misreporters do not experience a future earnings improvement, on average. This finding is consistent with these firms failing to remediate their latent internal control weaknesses and therefore relying on low quality internal information when making operating decisions. We estimate that the suspected IC misreporters in our sample fail to realize a present value of $1.7 million per firm in earnings in the three years following their IC misreporting, which we attribute to their failure to remediate ineffective internal controls. The $1.7 million estimate is conditional on 404(b) curbing 38.1 percent of IC misreporting and a six percent discount rate. This cost, borne only by IC misreporter shareholders (or an estimated 9.3 percent of exempt firms in our sample), aggregates to a total of $719 million. Discounting the future foregone earnings back to period t (i.e., the year of 404(b) exemption) allows the $719 million cost to be directly comparable to the $388 million audit fee savings.[4]

We also find that firms that disclose ineffective internal controls experience more negative abnormal stock returns in the year of the disclosure, relative to suspected IC misreporters. Our evidence suggests that IC misreporting delays the stock price incorporation of ineffective internal controls, in that stock price ultimately impounds this information as IC misreporters experience the negative consequences of ineffective internal controls such as a higher propensity to restate and delist. We estimate that IC misreporting delays a market value decline of $2.2 million for the average IC misreporter, conditional on 404(b) curbing 38.1 percent of IC misreporting, aggregating to a total of $935 million. This cost is borne by new shareholders who relied on the inaccurate internal control disclosures of IC misreporters. While lower future operating performance associated with IC misreporting is avoidable through remediation, the negative stock returns associated with IC misreporting are merely delayed.

We conclude with a bounds analysis to illustrate how various design choices affect our inferences. In our previously discussed benefits analysis, we compare the change in audit fees between exempt firms and non-exempt firms with a

[1] In our analyses, "non-exempt firms" are the smallest firms subject to 404(b) with market capitalizations of $300 million or less following Kinney and Shepardson (2011).

[2] The 35.7 percent incremental increase in audit fees is qualitatively similar to the increase in audit fees for firms that switch from exempt to non-exempt status (34.9 percent) and exempt firms that begin to voluntarily comply with 404(b) (29.7 percent).

[3] Kinney and Shepardson (2011) provide evidence that a similar percentage of exempt firms disclose ineffective internal controls as non-exempt firms, yet exempt firms incur a fraction of the audit cost. The authors conclude that 404(a) could be a cost-effective alternative to 404(b), which implicitly assumes that exempt firms have the same underlying distribution of ineffective internal controls as non-exempt firms. Their conclusion is premature, however, if exempt firms are more likely to maintain ineffective internal controls (i.e., exempt firms are more likely to misreport the effectiveness of their internal controls).

[4] Undiscounted foregone earnings are $2.0 million per suspected IC misreporter and $866 million in the aggregate.

market capitalization of $300 million or less, and estimate aggregate audit fee savings due to exemption of $388 million. The expected benefits range from $354 million to $463 million when we compare exempt firms to non-exempt firms with a market capitalization of less than $150 million or $200 million. In our previously discussed cost analyses, we define suspected IC misreporters as exempt firms that disclose effective internal controls and have a predicted score of maintaining ineffective internal controls in the top 20th percentile. We estimate that operating performance of these suspected IC misreporters is lower by $719 million. When we choose a cutoff value at the 10th, 15th, 25th, or 30th percentile, our inferences that costs continue to exceed the benefits remain the same. For example, using the 15th (25th) percentile cutoff yields a cost estimate of $577 ($837) million. We focus on the top 20th percentile cutoff value throughout the paper because this threshold yields an IC misreporting rate of 10.6 percent, which is nearest to the 9.3 percent IC misreporting suggested by our prediction model.

To conclude, we develop a prediction model that auditors, regulators, analysts, and investors can utilize to identify firms most likely to misreport their ineffective internal controls. This model indicates that 9.3 percent of exempt firms fail to disclose ineffective internal controls. Further analyses indicate that IC misreporting would fall by 38 percent (from 9.3 to 5.8 percent) with the auditor oversight provided by Section 404(b). Overall, we find that the costs of exemption due to IC misreporting ($719 million and $935 million) are larger than the benefit ($388 million in audit fee savings). On a per firm basis, the costs are $1.7 million and $2.2 million, and the benefit is $585 thousand. However, it is difficult to make normative statements about the overall net cost or benefit of exemption because the costs are borne by current and prospective shareholders of suspected IC misreporters (about 9.3 percent of exempt firms), whereas the benefits are realized by shareholders of all exempt firms.[5]

Our analyses of measurable costs and benefits of exemption to shareholders are one piece of information legislators can use when deciding whether to exempt additional firms (U.S. Congress, 2011, 2012, 2016a, 2016b). Determining whether exemption maximizes social welfare (Minnis and Shroff, 2017) is beyond the scope of our paper. In addition, we acknowledge that there are other important, but less separately measurable, benefits and costs of exemption (e.g., preserved manager time). These potential benefits and costs are discussed in Section 2.2, and many are implicitly incorporated in our future operating and stock return performance cost estimates.

Our paper proceeds as follows. In Section 2 we provide an overview of the internal control regulatory background and summarize the potential benefits and costs of Section 404(b) exemption. In Section 3 we describe the sample and present descriptive statistics. In Section 4 we quantify the benefits of exemption, and in Section 5 we quantify the costs of exemption (with our prediction model described in Section 5.1). We conclude in Section 6.

2. Background and potential benefits and costs of Section 404(b) exemption

2.1. Background

The Sarbanes-Oxley Act of 2002 (SOX) contains three sections (302, 404a, and 404b) related to the disclosure of internal control effectiveness. Under Section 302 (effective for all publicly traded firms for fiscal periods ending on or after August 29, 2002), management is required to evaluate and disclose its conclusion about the effectiveness of firm controls and procedures in each quarterly and annual report (SEC, 2002). Section 404(a) requires management to test the effectiveness of the firm's internal control structure and procedures and to disclose its assessment in each annual report, while Section 404 (b) requires auditors to test and include an auditor-provided opinion regarding their assessment of the same internal control structure and procedures in the firm's annual report (U.S. Congress, 2002).

The SEC classifies firms with public float (defined as aggregate worldwide market value of common equity held by non-affiliates as of the last business day of the firm's second quarter) between $75 and $700 million as “accelerated filers,” and firms with greater than $700 million of public float as “large accelerated filers” (Rule 12b-2 of the Securities Exchange Act). We use the term “accelerated filers” to refer to both groups. Accelerated filers are subject to Sections 404(a) and 404(b) for fiscal years ending on or after November 15, 2004.

In the debate over the costs and benefits of Section 404, the costs to small firms have been of particular concern (see review papers by Coates, 2007 and Coates and Srinivasan, 2014). In response to this concern, the SEC granted firms with less than $75 million in public float—the “non-accelerated filers”—multiple extensions in the Section 404 compliance deadline. Section 404(a) finally became effective for non-accelerated filers for fiscal years ending on or after December 15, 2007, more than three years after the 404(a) and 404(b) effective date for accelerated filers. Lawmakers permanently exempted non-accelerated filers from complying with Section 404(b) in July 2010 (Section 989 G of the 2010 Dodd-Frank Act; U.S. Congress, 2010). See Fig. 1 for a compliance timeline. Throughout the paper, we refer to non-accelerated filers as “exempt firms” and accelerated filers with a market capitalization of $300 million or less as “non-exempt firms.”

[5] Regarding who bears the cost, we find that insider ownership is on average 19.9 percent for exempt firms and 21.5 percent for suspected IC misreporters (untabulated). Thus, 80.1 (78.5) percent of the benefits we present would apply to outside shareholders of exempt firms (suspected IC misreporters).

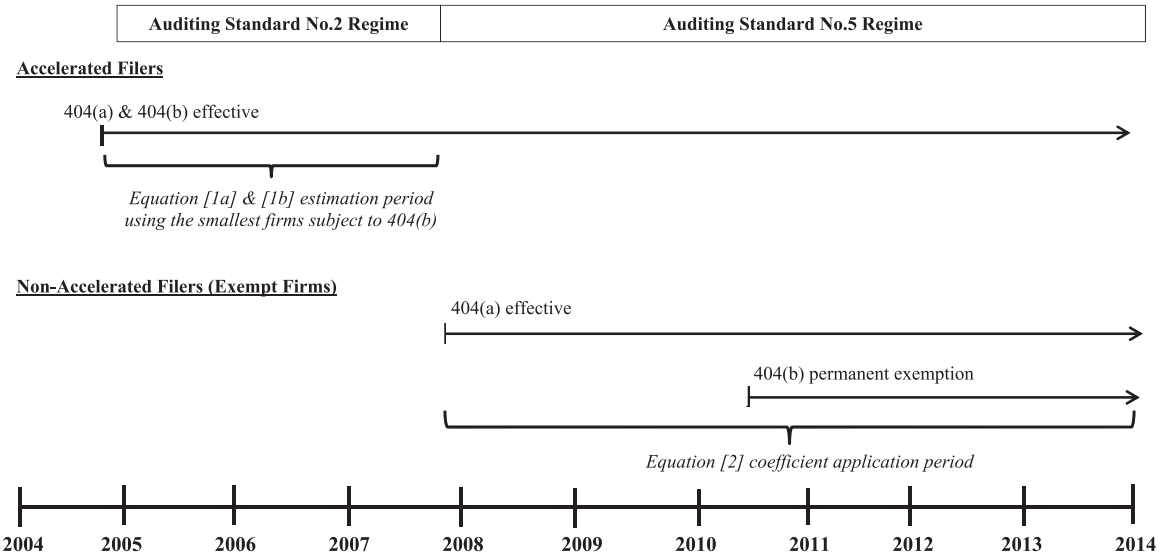

Fig. 1. *SOX Sections 404(a) and 404(b) Compliance Timeline.* Notes: The SEC classifies firms with a public float (defined as aggregate worldwide market value of common equity held by non-affiliates as of the last business day of the firm's most recently completed second quarter) between $75 million and $700 million as "accelerated filers," and firms with greater than $700 million of public float as "large accelerated filers." For these firms, Sections 404(a) and 404(b) are effective for fiscal years ending on or after November 15, 2004. The SEC classifies firms with less than $75 million in public float (measured as of the last day of the second quarter) as "non-accelerated filers" (i.e., "exempt firms" for the purposes of our study). For these firms, Section 404(a) was effective for fiscal years ending on or after December 15, 2007; the Section 404(b) compliance date was delayed multiple times before these firms were permanently exempted from 404(b) compliance in July 2010 (Section 989G of the Dodd-Frank Act).

2.2. Potential benefits and costs of 404(b) exemption

2.2.1. The role of the auditor

Section 404(b) proponents believe that managers seriously evaluate and disclose their firms' internal control effectiveness only if auditors are involved. The SEC also acknowledges the importance of auditor oversight, stating that "there is strong evidence that the auditor's role in auditing the effectiveness of [internal controls] improves the reliability of internal control disclosures and financial reporting overall and is useful to investors" (SEC, 2011, p.8).[6] Consistent with the importance of auditor oversight, Bedard et al. (2009) provide evidence that auditor intervention increases the disclosure of material weaknesses in internal control, and Bedard and Graham (2011) find that auditors detect 84 percent of ineffective internal controls. That auditors identify the bulk of the ineffective internal controls is especially concerning for exempt firm shareholders given managers have a strong incentive to avoid reporting ineffective internal controls, in part because ineffective internal controls are considered a "red flag" by both sell-side and buy-side analysts (Brown et al., 2015; Brown et al., 2016). Thus, auditor oversight under 404(b) may be necessary to identify ineffective internal controls, and the absence of such oversight may lead to IC misreporting.[7]

Others argue, however, that the higher audit fees associated with 404(b) bring little benefit. In particular, Kinney and Shepardson (2011) find that similar proportions of non-exempt and exempt firms disclose ineffective internal controls, yet exempt firms incur only a fraction of the audit fees. The authors conclude that "for small firms, management internal control reports and traditional financial audits may be a cost effective disclosure alternative to full application of SOX 404(b)" (p.413). An implicit assumption in Kinney and Shepardson (2011) is that internal control disclosures are accurate, and that exempt and non-exempt firms have similar underlying distributions of ineffective internal controls.[8] If these assumptions are correct, 404(b) seems superfluous; if these assumptions do not hold, however, 404(b) might provide benefits not documented in prior research.

Kinney et al. (2013) further question the value of 404(b), for firms of any size, by arguing that auditors have difficulty identifying ineffective internal controls absent a financial misstatement. They also note that "under existing auditing

[6] Investors seem agree with the SEC. In an October 2011 letter to the U.S. House of Representatives Financial Services Committee opposing exemptions from 404(b), the Chartered Financial Analysts Institute, Center for Audit Quality, and Council of Institutional Investors argued that compliance with Section 404(b) has contributed to an increase in overall audit quality and that all investors should have the same level of protection regarding the effectiveness of firms' internal controls regardless of firm size (CFA, 2011).

[7] To the extent that auditors are more likely than managers to classify minor internal control issues as weaknesses, we over-identify suspected IC misreporters. Over-identification biases against finding economically significant costs of IC misreporting.

[8] Although exempt firms generally have less complicated accounting issues, they also have fewer resources to devote to implementing and maintaining a sophisticated internal control system, as well as fewer employees available to ensure that duties are fully segregated. Prior research documents that, on average, smaller firms are more likely to maintain ineffective controls (e.g., Ge and McVay, 2005). This suggests that more exempt firms should be disclosing ineffective internal controls than non-exempt firms due to exempt firms' smaller size.

standards (AU 550, which was later recodified as AS 2710), if management makes statements in unaudited portions of Form 10-K that the auditor believes are a material misstatement of fact, such as providing a 404(a) assessment that controls are effective when the auditor believes otherwise, the issue must be resolved prior to the issuance of the auditor's opinion" (p.811). This quote suggests that even in the absence of 404(b), auditors implicitly opine on firms' internal control effectiveness, which again renders 404(b) superfluous.[9] If this is the case, the benefits of exemption should exceed the costs of exemption associated with IC misreporting.

2.2.2. Potential benefits of 404(b) exemption

There are a number of potential benefits of 404(b) exemption. The most remarked upon and measurable benefit is 404(b)-related audit fee savings (e.g., Iliev, 2010; Palmrose, 2010; Kinney and Shepardson, 2011). Another possible benefit of exemption is that it frees up management and employee time that would otherwise be spent with auditors. To quantify this benefit, however, one must observe how much time managers and employees are spending with auditors and consider the counterfactual of what they would otherwise do with that time (Leuz and Wysocki, 2016). A third possible benefit is lower firm litigation risk and legal costs, to the extent that plaintiffs use auditor-provided internal control effectiveness disclosures as evidence of misbehavior as suggested by Coates and Srinivasan (2014). However, it is also possible that 404(b) exemption leads to higher litigation risk. If ineffective internal controls go undiscovered, they cannot be remediated, and unremediated issues can lead to restatements that trigger litigation. In addition, evidence that ineffective internal controls were not discovered or were discovered but not remediated can indicate managerial negligence, which may also trigger litigation. While litigation risk can be measured, it is difficult to attribute any changes in litigation risk directly to ineffective internal controls (as opposed to restatements or large stock price drops), and its relation with exemption is ex ante unclear. In this study we focus on audit fee savings, the most measurable benefit of 404(b) exemption. However, to the extent employee time and litigation affect earnings and stock returns in the next three years, their net effect should be captured in our costs analysis discussed in the next section.

2.2.3. Potential costs of 404(b) exemption

Section 404(b) exemption is costly to the extent that it results in firms' failure to discover or disclose ineffective internal controls (i.e., IC misreporting). Potential costs of IC misreporting include the operational consequences of non-remediation, market values that fail to reflect a firm's underlying internal control status, and lower earnings quality.

Regarding non-remediation costs, a number of studies have documented the operational consequences of ineffective internal controls, such as inefficient investment or poor operating decisions due to poor information quality (Cheng et al., 2013; Feng et al., 2015). For example, Feng et al. (2015) find evidence that firms with ineffective inventory-related internal controls manage their inventory less effectively, presumably because poor internal information leads to suboptimal production, ordering, and obsolescence assessments. Prior research also provides evidence that managers were not fully aware of their firms' ineffective controls (and related effects) prior to SOX 404(b) (Feng et al., 2009). If managers fail to discover ineffective internal controls, then managers are unlikely to remediate them. Another possibility is that managers discover but fail to disclose ineffective controls in order to further their ability to extract rents (e.g., Hochberg et al., 2009; Cheng et al., 2013). If managers must discover and disclose ineffective internal controls before the internal controls can be remediated, then one likely cost of 404(b) exemption is lower future operating performance due to non-remediation among IC misreporters. We measure this cost by examining changes in future earnings. We expect suspected IC misreporters to exhibit lower future operating performance relative to firms that discover, disclose, and remediate ineffective internal controls.[10] This avoidable cost is borne by IC misreporter shareholders.

A second potential cost of IC misreporting results from market values that fail to reflect a firm's underlying internal control status. Prior research finds some evidence of negative stock market reactions to the disclosure of ineffective internal controls (Hammersley et al., 2008), which suggests that firms that maintain ineffective internal controls can temporarily avoid negative stock returns by inaccurately disclosing *effective* internal controls. Inaccurate disclosures merely delay the negative stock returns until the negative consequences of ineffective internal controls, such as financial restatements or performance-driven stock exchange delistings, are realized and impounded into price. This cost is largely borne by new investors who relied on inaccurate internal control disclosure when purchasing the stock of IC misreporters. To the extent that some of the negative stock returns are avoidable through remediation (e.g., future restatements that result from ineffective internal controls are avoidable), the costs of non-remediation are borne by both new and existing shareholders of IC misreporters. We measure this cost by comparing the abnormal stock returns of suspected IC misreporters with those of firms disclosing ineffective internal controls.

[9] Lu et al. (2011) also highlight the costs of Section 404 and point to Canada's low-cost alternative of self-reported internal control disclosures in firms' MD&A. They document an association between these disclosures and accruals quality, which suggests that the disclosures are at least somewhat credible. Nevertheless, Zhao et al. (2015) conclude that auditor effort is more effective when control testing is required, suggesting that there are incremental benefits to Section 404(b).

[10] For firms that discover and remediate ineffective internal controls, changes in future earnings captures improved operating performance net of remediation costs (e.g., incremental audit fees, system implementation fees, depreciation and amortization expense on internal controls hardware and software, employee time attributed to remediation, etc.). If managers generally discover and remediate ineffective internal controls without initially disclosing that their internal controls were ineffective, we will fail to find an association between suspected IC misreporting and future operating performance.

A third possible cost of 404(b) exemption is lower financial reporting quality and the reduced credibility of the accounting information associated with it. Prior research concludes that 404(b) exemption has compromised the financial reporting quality of exempt firms (Krishnan and Yu, 2012; Holder et al., 2013). Prior research also documents, however, that auditors are largely able to "audit around" ineffective internal controls, mitigating the effects on reported earnings (e.g., Doyle et al., 2007a). Because it is difficult to disentangle the effects of internal controls from those of the auditors' substantive testing on earnings quality, we do not consider financial reporting quality as a separate measurable cost of IC misreporting.

Gao et al. (2009) identify other possible costs of exemption driven by managers' desire to stay below the exemption threshold (i.e., a public float of $75 million). They provide evidence that to avoid reaching this threshold, managers take strategic actions such as making cash payouts to shareholders, making bad news disclosures, and reporting lower earnings. As these costs apply only to firms near the exemption threshold, we do not directly incorporate the costs of these actions into our analysis. However, to the extent these actions affect earnings and stock returns in the next three years, their net effect is captured in our analysis.

In summary, we focus on two measurable costs of IC misreporting attributed to 404(b) exemption—lower operating performance due to non-remediation and market values that fail to reflect a firm's underlying internal control status—by examining changes in future earnings and future stock returns for suspected IC misreporters. As previously noted, our measures also capture a number of additional implications associated with exemption (e.g., the impact on legal fees, employee time, cost of capital and thus the ability to invest, etc.). We summarize these potential benefits and costs of exemption in Appendix A.

3. Sample and descriptive statistics

3.1. Sample formation

We begin with the universe of 11,274 exempt firm-years from 2007 through 2014 with non-missing Section 404 (a) internal control disclosure data from Audit Analytics, market capitalization and total assets greater than $5 million from Compustat, and non-missing Central Indexing Key (CIK) and fiscal year end from Compustat. Because our goal is to examine the accuracy of internal control disclosures absent 404(b), we exclude 1,427 firm-years of exempt firms that voluntarily comply with 404(b) from our main analyses. Following Kinney and Shepardson (2011), we eliminate 4,269 non-exchange-traded firm-years, because exchange- and non-exchange-traded firms differ on a variety of dimensions (e.g., Leuz et al., 2008). In addition, IC misreporting is only important when investors expect truthful disclosure, and investors are generally aware of non-exchange-traded firms' poor disclosure practices (Jiang et al., 2016). Finally, we eliminate 276 observations with missing variable values, yielding a final sample of 5,305 exempt firm-year observations.[11]

3.2. Sample internal control disclosure statistics

Table 1 lists the numbers and percentages of exempt firm-year internal control disclosures from 2007 through 2014.[12] We find that, on average, 10.9 percent of exempt firms disclose an internal control weakness over this eight-year time period; 13.6 percent disclose ineffective controls in 2007, and the percentage ranges from 9.2 to 14.2 percent in the subsequent seven years.[13] As our exemption cost estimates are based on an internal control effectiveness prediction model estimated using a sample of non-exempt firms with market capitalization of $300 million or less during the Auditing Standard No. 2 (AS2) audit regime (2004–2006), we also present internal control descriptive statistics for this group of observations.[14] During the AS2 regime, 14.4 percent of non-exempt firms disclosed ineffective internal controls, which is notably higher than the 8.0 percent figure for all other accelerated filers (i.e., firms with market capitalization of more than $300 million) during the same time period. These percentages are consistent with prior research documenting that larger firms tend to have fewer internal control problems (e.g., Ge and McVay, 2005). For completeness, we present statistics for both non-exempt firms and all other accelerated filers through 2014. In Appendix B we present descriptive statistics of the types of weaknesses disclosed within each classification. In general, exempt firms have more fundamental issues, such as segregation of duties, and fewer complexity-related weaknesses.

[11] Due to the above restrictions, our final sample size is smaller than the five thousand exempt firms mentioned in the introduction (PCAOB, 2015).

[12] Among non-exempt firms, we use the auditor's internal control opinion (which is only different from the management opinion in one instance in our sample). Among exempt firms, we use management's internal control opinion.

[13] Using a sample that requires only Audit Analytics data, Kinney and Shepardson (2011) report that 23.7 (22.4) percent of non-accelerated filers (herein exempt firms) disclose ineffective internal controls in 2007 (2008). We calculate similar percentages (22.8 percent in 2007 and 27.9 percent in 2008) when we use only Audit Analytics data (untabulated). Our final sample conditions on exchange status and data availability in Compustat, CRSP, Thomson Reuters, and GMI Ratings.

[14] As we argue in Section 5.1.2, these years provide the best representation of the underlying internal control effectiveness within non-exempt firms. Non-exempt firms are defined as accelerated filers with an end-of-year market capitalization of $300 million or less in each of the three years centered on the Section 404(b) effective date (i.e., fiscal years ending between November 15, 2003 and November 14, 2005). Kinney and Shepardson (2011) similarly use a $300 million market capitalization threshold to define non-exempt firms.

Table 1
Internal Control Effectiveness Frequencies

	Auditing Standard No. 2 Regime				Auditing Standard No. 5 Regime								
	2004	**2005**	**2006**	**Total**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**Total**
Exempt Firms													
(Non-Accelerated Filers < $75 M public float)													
Firm-years with $DisclosedIneffective_t=1$					78	70	70	77	70	63	69	80	577
Total firm-years					575	711	758	770	669	640	617	562	5302
% with $DisclosedIneffective_t=1$					13.6%	9.8%	9.2%	10.0%	10.5%	9.8%	11.2%	14.2%	10.9%
Non-Exempt Firms													
(Accelerated Filers ≤ $300 M MVE)													
Firm-years with $DisclosedIneffective_t=1$	92	79	80	251	*115*	*90*	*43*	*37*	*51*	*46*	*53*	*67*	*502*
Total firm-years	452	636	656	1744	*1131*	*1344*	*845*	*662*	*798*	*708*	*537*	*604*	*6629*
% with $DisclosedIneffective_t=1$	20.4%	12.4%	12.2%	14.4%	*10.2%*	*6.7%*	*5.1%*	*5.6%*	*6.4%*	*6.5%*	*9.9%*	*11.1%*	*7.6%*
All Other Accelerated Filers													
(Accelerated Filers > $300 M MVE)													
Firm-years with $DisclosedIneffective_t=1$	*245*	*174*	*165*	*584*	*120*	*31*	*28*	*42*	*50*	*61*	*82*	*95*	*509*
Total firm-years	*2303*	*2424*	*2557*	*7284*	*2379*	*1955*	*2178*	*2307*	*2163*	*2304*	*2481*	*2476*	*18243*
% with $DisclosedIneffective_t=1$	*10.6%*	*7.2%*	*6.5%*	*8.0%*	*5.0%*	*1.6%*	*1.3%*	*1.8%*	*2.3%*	*2.6%*	*3.3%*	*3.8%*	*2.8%*

Notes: This table presents internal control over financial reporting frequencies using data from Audit Analytics Section 404. We require firms to have non-missing total assets, market value of equity (MVE, defined as PRCC_F × CSHO), Central Indexing Keys (CIKs), and fiscal year ends (DATADATE) in Compustat. We delete firm-years with less than $5 million in total assets or market capitalization and non-accelerated filer firm-years that voluntarily comply with Section 404(b). Non-accelerated filers (exempt firms) are required to comply with SOX Section 404(a) for fiscal years ending on or after December 15, 2007. For these firms, the "2007" compliance year includes fiscal years ending between December 15, 2007 and December 14, 2008, the "2008" compliance year includes fiscal years ending between December 15, 2008 and December 14, 2009, etc. Accelerated filers are required to comply with SOX Sections 404 (a) and 404(b) for fiscal years ending on or after November 15, 2004. For these firms, the "2004" compliance year includes fiscal years ending between November 15, 2004 and November 14, 2005, the "2005" compliance year includes fiscal years ending between November 15, 2005 and November 14, 2006, etc. "Non-exempt Firms" are defined as accelerated filers with an end-of-year market capitalization of $300 million or less in each of the three years centered on the Section 404(b) effective date (i.e., fiscal years ending between November 15, 2003 and November 14, 2005). "All other accelerated filers" are defined as accelerated filers not classified as non-exempt firms. Values in italics are presented only for descriptive purposes, and these observations are not used in our analysis.

4. Benefits of 404(b) exemption

We estimate the key benefit of 404(b) exemption as the audit fee savings by exempt firms. To estimate audit fee savings, we compare the percentage increase in audit fees from 2003 to 2014 for non-exempt firms relative to exempt firms, and attribute the difference to 404(b) audit compliance costs.[15] Because the increase in audit fees from 2003 to 2014 is partially driven by inflation, we convert audit fees into 2014 real dollars.

As reported in Table 2, Panel A, the mean exempt firm paid $204,830 in audit fees in 2003 and $259,163 in 2014, for a mean increase of 26.5 percent. In contrast, the mean non-exempt firm paid $430,200 in audit fees in 2003 and $697,999 in 2014, for a mean increase of 62.3 percent. We attribute this 35.7 percent incremental audit fee increase to 404 (b) compliance, so it serves as our estimate of the percentage of audit fee savings from 404(b) exemption.[16] In Panel B we multiply this 35.7 percent by exempt firms' mean audit fees in 2003 to estimate that the average exempt firm would have experienced an incremental $73,165 in annual audit fees if subject to 404(b). As there are 5,302 exempt firm-years in our sample, this translates to an aggregate audit fee savings of $388 million related to 404(b) exemption for our eight-year sample period (2007–2014).

The $388 million is a ballpark estimate of the benefits of 404(b) exemption for the 5,305 exempt firm-years in our sample, as our calculation applies the full incremental increase in audit fees over time to each firm-year. Thus, the increase captures not just an initial shock to audit fees but also a long-term average percentage change, which is important given that non-exempt firms' audit fees increased significantly in 2004 (the first year of 404(b) compliance) and then declined over time (Table 2, Panel A).

To address the potential concern that the incremental increase in audit fees for non-exempt firms is due to systematic differences between exempt and non-exempt firms, we consider two alternative benchmarks that use exempt firms as their own control. We first examine the change in audit fees for 238 firms that switch from "non-accelerated" to "accelerated" filer status and thus are subject to 404(b). In these "switching firms," the average audit fee increased by 34.9 percent in the first year of 404(b) compliance (untabulated). We next examine the change in audit fees for 273 exempt firms in their first

[15] Although exempt firms did not comply with SOX 404 until 2007, we begin our comparison in 2003 instead of 2006 as there was an overall increase in audit fees in the post-SOX era, and we want to avoid attributing this full increase to 404(b) compliance costs. By measuring both groups of firms over the same period, we are able to attribute the incremental increase in audit fees among non-exempt firms to 404(b) compliance costs.

[16] We note that our estimate of a 35.7 percent increase in audit fees is qualitatively similar to Iliev's (2010) finding that foreign firms with a public float of just below the exemption threshold had 30 percent lower audit fees than did non-exempt foreign firms with a public float of just above the threshold.

Table 2
Assessing the Audit Fee Benefit of 404(b) Exemption
Panel A: Mean Audit Fees by Year and Filing Status

Exempt Firms				Non-Exempt Firms			
Year	404(a) compliance year	N	Mean audit fees (2014 real dollars)	Year	404(a) & (b) compliance year	N	Mean audit fees (2014 real dollars)
2003	–	439	$204,830	2003	–	450	$430,200
2004	–	472	$257,506	2004	1	451	$939,069
2005	–	508	$275,143	2005	2	632	$781,082
2006	–	514	$292,448	2006	3	640	$736,527
2007	1	514	$287,216	2007	4	1029	$802,143
2008	2	631	$290,824	2008	5	1225	$926,090
2009	3	699	$287,291	2009	6	778	$759,951
2010	4	713	$274,660	2010	7	627	$656,036
2011	5	635	$266,030	2011	8	761	$700,294
2012	6	617	$262,336	2012	9	677	$715,203
2013	7	599	$254,737	2013	10	518	$663,080
2014	8	547	$259,163	2014	11	585	$697,999
	%Δ 2003 to 2014:		26.53%		%Δ 2003 to 2014:		62.25%

Panel B: Estimate of Incremental Audit Fee Savings due to 404(b) Exemption

62.25%	%Δ in mean audit fees paid by non-exempt firms (2003–2014) (Table 2, Panel A)
–26.53%	–%Δ in mean audit fees paid by exempt firms (2003–2014) (Table 2, Panel A)
35.72%	Incremental %Δ in mean audit fees attributed to 404(b) compliance
x $204,830	x Mean annual audit fees paid by exempt firms in 2003
$73,165	Estimated annual incremental cost of 404(b) compliance per exempt firm in our sample
x 5302	x Number of exempt firm-years in our sample during the 404(b) exemption period (2007–2014)
$387,922,293	Aggregate incremental benefit of 404(b) exemption for all exempt firm-years in our sample during the 404(b) exemption period

Notes: All dollar values are in 2014 real dollars. All variables are defined in Appendix C, and all continuous variables are winsorized at the 1st and 99th percentiles by fiscal year. "Exempt firms" are non-accelerated filers not subject to 404(b), and "non-exempt firms" are accelerated filers with market capitalization of $300 million or less in 2003 through 2005, following Kinney and Shepardson (2009).

year of voluntary compliance with 404(b). The average voluntary complier experiences a 29.7 percent increase in audit fees that year (untabulated).[17] Both estimated percentages are qualitatively similar to the 35.7 percent increase reported in Table 2, corroborating our benefit estimate.

5. Costs of 404(b) exemption

To investigate whether 404(b) exemption results in the failure to discover and disclose ineffective internal controls, we must first form an assessment of firms' latent internal control effectiveness. In Section 5.1, we develop a prediction model of internal control effectiveness. In Section 5.2, we use this model to identify suspected IC misreporting among exempt firms. This analysis includes validity tests of our prediction model, as well as estimates of how much IC misreporting would be curbed by auditor oversight under 404(b). Finally, in Section 5.3, we estimate the potential costs of 404(b) exemption using the identification of suspected IC misreporters and the degree to which we expect 404(b) to curb IC misreporting. As a preview, we estimate that the cost of exemption related to lower operating performance from non-remediation is $719 million, which is nearly double our estimated $388 million benefit of exemption from audit fee savings. This cost is borne by shareholders of IC misreporters (approximately 9.3 percent of exempt firms). We also estimate that the cost of exemption related to the failure to disclose ineffective internal controls is $935 million—an economically significant cost borne by new shareholders relying on inaccurate internal control disclosures. In Section 5.4 we present bounds on our benefit and cost estimates to illustrate how various assumptions affect our estimates.

[17] The lower percentage increase is consistent with endogeneity in the choice to voluntarily comply (e.g., the voluntary firms might anticipate a lower increase in audit cost). Anecdotally it seems that many voluntary compliers do so in anticipation of becoming accelerated filers (non-exempt). For example, BSD Medical Corporation (now Perseon Corp) filed its first 404(b) report in 2010, when its public float was only $26.4 million, then filed in 2011 as an accelerated filer with a float of $99.5 million. This anticipation issue is why we chose not to use the subsample of voluntary compliers to corroborate our cost estimates. To the extent that expected future performance is correlated with the decision to voluntarily comply with 404(b), we do not want to attribute the increase in return on assets and stock returns for these firms to voluntary compliance.

5.1. Model of ineffective internal controls

5.1.1. Identifying ineffective internal controls

We form a prediction model of internal control effectiveness using non-exempt firms and apply the estimated coefficients to exempt firms. The application of these out-of-sample parameters allows us to estimate the percentage of exempt firms that disclose effective internal controls but appear to maintain ineffective internal controls (i.e., suspected IC misreporters).

5.1.2. Prediction model of internal control effectiveness

Eq. (1a) includes 16 internal control effectiveness determinants from prior research (Ge and McVay, 2005; Doyle et al., 2007b; Ashbaugh-Skaife et al., 2009), and one additional variable (*Prior404302*).[18] The *Prior404302* variable controls for whether a firm has an internal control weakness disclosed in the previous year's 404 or the previous three quarters' 302 reports, and it takes into account the possibility that internal control quality might be persistent over time. With these 17 variables, we estimate the following model:

$$\begin{aligned} MaintainedIneffective_t = {} & \beta_1 Foreign_{t-1,t} + \beta_2 M\&A_{t-1,t} + \beta_3 Restructure_{t-1,t} \\ & + \beta_4 ExtrSalesGrowth_{t-2,t} + \beta_5 ExtrInvGrowth_{t-2,t} + \beta_6 AggLoss_{t-1,t} + \beta_7 Restate_{t-2,t-1} \\ & + \beta_8 Seg_t + \beta_9 Age_t + \beta_{10} LitigiousInd_t + \beta_{11} ComputerInd_t + \beta_{12} BankInd_t + \beta_{13} Size_{t-1} \\ & + \beta_{14} Cash_{t-1} + \beta_{15} Governance_{t-1} + \beta_{16} InstOwn_{t-1} + \beta_{17} Prior404302_t + \varepsilon_t \end{aligned} \tag{1a}$$

The dependent variable *MaintainedIneffective* is equal to one if a firm maintains ineffective internal controls in year *t*, and zero otherwise. As we want to identify firms that *maintain* ineffective internal controls and not just firms that *disclose* ineffective internal controls, we set the *MaintainedIneffective* indicator variable equal to one if a firm either (1) discloses ineffective internal controls (*DisclosedIneffective*=1; N=251) or (2) discloses effective internal controls but either subsequently restates its year *t* financial statements as a result of internal control issues (N=70, identified by Rice et al., 2015) or amends its year *t* Section 404 (b) report to conclude that its internal controls were actually ineffective (N=9, identified using Audit Analytics data).

We omit the model intercept in Eq. (1a) to avoid setting a baseline proportion of firms that maintain ineffective internal controls.[19] Instead, we form our prediction solely on economic determinants without requiring the baseline proportion of exempt firms that maintain ineffective internal controls to be similar to that of non-exempt firms. Independent variables are defined in Appendix C.

We face several complications in deciding which firms to use in estimating, and which variables to use in forming, our out-of-sample prediction model. The first complication relates to which *observations* to use in estimating Eq. (1a). Firms subject to 404(b) are significantly larger than exempt firms, and internal control quality varies with firm size (Ge and McVay, 2005), as do the types of disclosed weaknesses (see Appendix B). For this reason, we estimate our logistic model using firms subject to 404(b) with a market capitalization of $300 million or less (measured in the three-year window centered on the initial 404(b) compliance year). We refer to these observations as "non-exempt firms."[20]

The second complication relates to which non-exempt firm *years* to use in estimating Eq. (1a). Table 1 reports a monotonic time-series decline in the percentage of non-exempt firms disclosing ineffective internal controls in their first six years of compliance (with an uptick in recent years). One reason for this decline is the remediation of ineffective internal controls. This trend is more modest for exempt firms, suggesting that exempt firms are less likely to remediate their disclosed internal control problems.

Another reason for this decline is that accelerated filers were audited under two auditing regimes. Auditing Standard No. 2 (AS2) was issued by the Public Company Accounting Oversight Board (PCAOB) in 2004 to provide guidance on auditing internal controls over financial reporting. The standard, viewed as a "bottom up" approach, generated extensive auditor documentation and testing of internal controls. In 2007 the cumbersome and costly AS2 was replaced with Auditing Standard No. 5 (AS5), which was later recodified as AS 2201. This standard is seen as a top-down, risk-based approach that focuses on the most important audit matters (e.g., Krishnan et al., 2011; PCAOB, 2015). AS5 permits auditors to rely on the work of others in the attestation process (e.g., less expensive employees or third-party vendors) and to conduct alternative

[18] We use the average of year *t*–1 and year *t* values when measuring "flow" variables (e.g., $ExtrSalesGrowth_{t-1,t}$) and "event" variables (e.g., $M\&A_{t-1,t}$) to capture of the effect of prior and current year performance and events on internal controls quality. The one exception is that we measure prior restatements ($Restate_{t-2,t-1}$) in years *t*–2 and *t*–1 to avoid the confounding effect of concurrent restatements and material weakness disclosures. We measure firm size ($Size_{t-1}$) and cash ($Cash_{t-1}$) at year *t*–1 because these two variables represent the firm's resources available for investment in internal controls during the year. Similarly, we measure governance ($Governance_{t-1}$) and monitoring ($InstOwn_{t-1}$) in year *t*–1, as governance in the prior period would be associated with the decision to maintain effective internal controls. Remaining variables are measured at the end of year *t*.

[19] Recall that we expect these smaller firms to have a higher proportion of ineffective internal controls. Allowing an intercept yields a similar ROC curve of 0.896 (untabulated).

[20] Re-estimating Eq. (1b) using accelerated filers with a market capitalization of $200 million or less results in a 57 percent sample size loss but yields a qualitatively similar ROC of 0.894 (untabulated). We use a market capitalization of $300 million or less to maintain consistency with prior literature (Kinney and Shepardson, 2011) and to avoid basing our estimates on too small a sample. We use market capitalization as a proxy for public float, as the latter must be hand-collected. Gao et al. (2009) report a 0.78 correlation between market capitalization and public float.

internal control testing procedures in place of time-consuming, elaborate internal control walk-throughs (Coates and Srinivasan, 2014). AS5 also eliminates unnecessary audit procedures, and is designed to be scalable to the size and complexity of each audit (PCAOB, 2014).

Although AS5 internal control audits are intended to be more efficient, many are concerned that AS5 fails to identify many material weaknesses (e.g., PCAOB, 2009; PCAOB, 2013; PCAOB, 2014, PCAOB, 2015; DeFond and Lennox, 2017; Schroeder and Shepardson, 2016). To illustrate, the PCAOB's audit inspection report during the 2004–2006 AS2 regime failed to identify any flaws with internal control audits (PCAOB, 2007). However, by 2010 16 percent of Big 4 internal control audits inspected by the PCAOB were deemed deficient. By 2013 the number had risen to 36 percent, leading PCAOB Board Member Jeanette Franzel to speculate that "there may be undisclosed [internal control] material weaknesses" (PCAOB, 2015). Because our purpose is to estimate the underlying *existence* of ineffective internal controls, we focus on the three years of non-exempt firms' internal control disclosures under the AS2 audit regime (2004–2006), a period when internal control audits were more likely to identify underlying internal controls weaknesses (Schroeder and Shepardson, 2016). In sum, we estimate Eq. (1a) using firms subject to 404(b) with market capitalizations of $300 million or less (referred to as "non-exempt firms") during the AS2 time period (2004–2006).

The third complication is which independent variables to include in our model. Prior research modeling internal control effectiveness included accelerated filers of all sizes (e.g., Ge and McVay, 2005; Doyle et al., 2007b; Ashbaugh-Skaife et al., 2009), so it is possible that some of the variables identified as significant in prior studies do not predict ineffective internal controls for our sample (the smallest of the firms subject to 404(b)).[21] To address this issue, and to ensure objectivity, we estimate Eq. (1a) using a backward elimination technique that iteratively determines which of the 17 independent variables are significantly associated with our dependent variable (Lawless and Singhal, 1978). Specifically, we use a stepwise logistic regression and set the significance level for variable elimination at 15 percent.[22] This procedure yields a model that includes only the variables significantly associated with maintaining ineffective internal controls. Retaining only significant coefficients is important because these coefficients are used to predict the likelihood that exempt firms maintain ineffective internal controls. A similar procedure and significance level are used by Dechow et al. (2011) to form a prediction model of misstatements.

Table 3, Panel A provides the frequency of maintaining and disclosing ineffective internal controls for non-exempt observations during the AS2 regime with data required to estimate Eq. (1a). Panel B provides descriptive statistics for the Eq. (1a) variables. Univariate relations are generally consistent with expectations.

We apply the stepwise logistic selection procedure and identify nine of the 17 independent variables as significantly associated with ineffective internal controls in year *t*. Thus, the final prediction model is as follows:

$$\begin{aligned} MaintainedIneffective_t = {} & \beta_1 AggLoss_{t-1,t} + \beta_2 Restate_{t-2,t-1} + \beta_3 Seg_t + \beta_4 Age_t + \beta_5 BankInd_t \\ & + \beta_6 Size_{t-1} + \beta_7 Cash_{t-1} + \beta_8 InstOwn_{t-1} + \beta_9 Prior404302_t + \varepsilon_t \end{aligned} \tag{1b}$$

The parameter estimates from Eq. (1b) are provided in Table 3, Panel C. Although not directly comparable to prior research because of the time period examined and our focus on the smallest firms subject to 404(b), the coefficients are significant in the directions documented by prior research (Ge and McVay, 2005; Doyle et al., 2007b; Ashbaugh-Skaife et al., 2009). In particular, aggregate losses (*AggLoss*), restatements (*Restate*), the number of business and geographical segments (*Seg*), and the prior disclosure of a material weakness (*Prior404302*) all increase the likelihood of maintaining ineffective internal controls. Older firms (*Age*), larger firms (*Size*), firms with more cash (*Cash*), and firms with higher institutional ownership (*InstOwn*) are all less likely to maintain ineffective internal controls.[23] Industry also plays a significant role, with the banking industry having a lower likelihood of maintaining ineffective internal controls (*BankInd*). Our model's area under the ROC curve is 0.887, which indicates excellent discrimination per Hosmer and Lemeshow (2000, p.162).

5.2. Identifying internal control misreporting among exempt firms

5.2.1. Applying our model to exempt firms

To assess the cost of exemption, we require an estimate of IC misreporting absent 404(b). Thus, we apply the Eq. (1b) coefficients developed using non-exempt firms' data (presented in Table 3, Panel C) to the 5,305 exempt firm-years from 2007 through 2014 to form an out-of-sample prediction of the likelihood that exempt firms maintain ineffective internal controls:

[21] In exploratory analyses, we considered several additional variables not included by prior research that might be relevant in explaining exempt firms' internal control effectiveness (e.g., industry-adjusted number of employees, financial reporting complexity from Filzen and Peterson (2015), and strength of employee relations from the KLD STATs database). While the employee relations variable was retained by our backwards elimination technique and was found to have a negative relation with a firm's internal control effectiveness, we did not include this variable in our final Eq. (1b) model because it resulted in a 73 percent reduction in sample size (untabulated).

[22] The ROC curve using a 10 (20) percent significance level for variable elimination is 0.887 (0.889), which suggests that the choice of significance level has little impact on explanatory power (untabulated).

[23] Univariate t-tests of differences in means show that non-exempt firms maintaining ineffective internal controls are larger and engage in more complex transactions (i.e., they are more likely to have foreign operations, have more business segments, engage in M&A and restructuring, etc.) relative to non-exempt firms maintaining effective internal controls (Table 3, Panel B). Consistent with complexity driving the association between size and ineffective internal controls, after we control for complexity (*Seg*), larger firms are less likely to maintain ineffective internal controls (Table 3, Panel C).

Table 3
Determinants of Maintaining Ineffective Internal Controls During the Auditing Standard No. 2 Regime (Non-Exempt Firms)

Panel A: *DisclosedIneffective*$_t$ and *MaintainedIneffective*$_t$ Frequencies after Imposing Eq. (1a) Data Requirements

	2004	2005	2006	Total
Firm-years with *DisclosedIneffective*$_t$ =1	92	79	80	251
Total firm-years	452	636	656	1744
% with *DisclosedIneffective*$_t$ =1	20.4%	12.4%	12.2%	14.4%
Firm-years with *MaintainedIneffective*$_t$ =1	127	105	98	330[a]
Total firm-years	452	636	656	1744
% with *MaintainedIneffective*$_t$ =1	28.1%	16.5%	14.9%	18.9%

Panel B: Descriptive Statistics

	MaintainedIneffective$_t$ =1 (N = 330)			*MaintainedIneffective*$_t$ = 0 (N = 1414)	
Variables	Mean	Median	Predicted Diff. (t-test of means)	Mean	Median
Foreign$_{t-1,t}$	0.373	0.000	>***	0.245	0.000
M&A$_{t-1,t}$	0.445	0.000	>**	0.378	0.000
Restructure$_{t-1,t}$	0.133	0.000	>**	0.093	0.000
ExtrSalesGrowth$_{t-2,t}$	0.091	0.000	>	0.090	0.000
ExtrInvGrowth$_{t-2,t}$	0.100	0.000	>	0.088	0.000
AggLoss$_{t-1,t}$	0.530	1.000	>***	0.383	0.000
Restate$_{t-2,t-1}$	0.503	1.000	>***	0.107	0.000
Seg$_t$	4.212	4.000	>***	3.152	2.000
Age$_t$	2.583	2.485	<**	2.510	2.485
LitigiousInd$_t$	0.233	0.000	?	0.272	0.000
ComputerInd$_t$	0.179	0.000	>***	0.093	0.000
BankInd$_t$	0.088	0.000	<***	0.202	0.000
Size$_{t-1}$	5.189	5.215	?***	5.078	5.080
Cash$_{t-1}$	0.266	0.184	<	0.278	0.138
Governance$_{t-1}$	0.447	0.444	<**	0.492	0.444
InstOwn$_{t-1}$	0.167	0.000	<*	0.191	0.000
Prior404302$_t$	0.773	1.000	>***	0.096	0.000

Panel C: Stepwise Logistic Determinants Model Output

Variables	Pred.	Y = *MaintainedIneffective*$_t$
AggLoss$_{t-1,t}$	+	0.301**
		(1.71)
Restate$_{t-2,t-1}$	+	0.940***
		(4.98)
Seg$_t$	+	0.072**
		(2.29)
Age$_t$	–	-0.344***
		(-2.76)
BankInd$_t$	-	-0.714***
		(-2.41)
Size$_{t-1}$	–	-0.361***
		(-4.68)
Cash$_{t-1}$	–	-1.088***
		(-3.34)
InstOwn$_{t-1}$	–	-1.285***
		(-4.46)
Prior404302$_t$	+	3.161***
		(17.65)
N Y=1		330
N Observations		1744
ROC		0.887
Standard Errors Clustered		Firm
Probability Threshold		0.150

Notes: All variables are defined in Appendix C, and all continuous variables are winsorized at the 1st and 99th percentiles by fiscal year. In Panel C we use a logistic specification, and z-statistics are presented below each coefficient. ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively, using two-tailed (one-tailed) p-values for non-directional (directional) predictions.

[a] We identify 330 firm-years as having maintained ineffective internal controls (*MaintainedIneffective*$_t$ = 1) and 251 firm-years where the firm disclosed ineffective controls in its Form 10-K (*DisclosedIneffective*$_t$ = 1). We also identify an additional 79 firm-years that restated their financial statements and indicated that their internal controls were originally reported as effective but should have been deemed ineffective. Of these 79 observations, 70 were identified by Rice and Weber (2012) and Rice et al. (2015), and nine were identified by amended Section 404(b) reports within Form 10-K/A (Audit Analytics).

$$PredictedValue_t = 0.301 \times AggLoss_{t-1,t} + 0.940 \times Restate_{t-2,t-1} + 0.072 \times Seg_t - 0.344 \times Age_t - 0.714 \times BankInd_t - 0.361 \times Size_{t-1} - 1.088 \times Cash_{t-1} - 1.285 \times InstOwn_{t-1} + 3.161 \times Prior404302_t \quad (2)$$

To ease interpretation, we transform *PredictedValue* into *PredictedProbability*, a variable bound between zero and one, using the equation $PredictedProbability = e^{(PredictedValue)} \div (1 + e^{(PredictedValue)})$. This monotonic transformation preserves the rank of *PredictedValue* values. *PredictedProbability* values closer to one (zero) indicate a higher (lower) expected likelihood that a firm maintains ineffective internal controls.

5.2.2. Prediction model validity tests

We validate our Eq. (2) prediction model in several ways. Results from these tests are presented in Table 4, Panels A–D. First, Table 4, Panel A presents descriptive statistics for the nine Eq. (2) variables for the 5,305 exempt firm-years. Variable differences between exempt firms that disclose effective versus ineffective internal controls are similar to the results for non-exempt firms reported in Table 3, Panel B. Re-estimating Eq. (1b) using exempt firm observations identifies eight of nine variables (all but the number of segments) as significant and yields an ROC curve of 0.902 (untabulated). To the extent that the determinants differ between the two samples, we identify IC misreporting among exempt firms with error. Such classification error makes it more difficult to find supporting evidence in our classification validity, cross-sectional, and "status switcher" tests (detailed in Section 5.2.3).

Second, we expect that firms disclosing ineffective internal controls have higher *PredictedProbability* values than firms disclosing effective internal controls. As illustrated in Panel B, the mean *PredictedProbability* value is 67.2 percent among firms disclosing ineffective internal controls, but only 14.5 percent among firms disclosing effective internal controls. The mean *PredictedProbability* value for the full sample is 0.202, indicating that 20.2 percent of exempt observations (1071 firm-years) *maintain* ineffective internal controls. However, only 10.9 percent (577 firm-years) *disclose* ineffective internal controls. Combined, these statistics suggest that 9.3 percent (=20.2–10.9) of exempt firm-years inaccurately disclose effective internal controls. Stated alternatively, within firms we predict to have ineffective internal controls, almost half misreport their internal control status (= [1071–577] ÷ 1071 = 46 percent).

Third, we form quintiles based on *PredictedProbability* values. If our model has no predictive ability, then firm-year observations disclosing effective and ineffective internal controls should be distributed uniformly across quintiles. In contrast, if our model can predict whether firms *maintain* effective internal controls, then firm-years that disclose ineffective internal controls should cluster in the quintile with the highest *PredictedProbability* values (Dechow et al., 2011). Table 4, Panel C displays a monotonic decrease in the number of firm-years disclosing ineffective internal controls (*DisclosedIneffective*=1) across *PredictedProbability* quintiles, with clustering in the top quintile. To illustrate, 86.3 percent of the *DisclosedIneffective*=1 observations are in the top *PredictedProbability* quintile, while only 2.1 percent are in the bottom quintile. In contrast, the number of firm-years disclosing effective internal controls (*DisclosedIneffective*=0) is reasonably similar across the bottom four quintiles of *PredictedProbability* quintiles, with the smallest number in the top quintile, as expected.

We use the information in Panel C to classify the exempt observations disclosing effective internal controls (*DisclosedIneffective*=0) into two groups: firms suspected of misreporting internal control effectiveness (*SuspectedIneffective*=1), and firms deemed to be credibly disclosing effective internal controls (*CrediblyEffective*=1). Fig. 2 provides a graphical presentation of how firms are classified for purposes of our subsequent analyses. *SuspectedIneffective* is an indicator variable set equal to one for the 562 firm-years with *DisclosedIneffective*=0 and a *PredictedProbability* value in the top quintile in Panel C (i.e., *PredictedProbability* ≥ 0.217). *CrediblyEffective* is an indicator variable set equal to one for firm-years with *DisclosedIneffective*=0 and a *PredictedProbability* value in the four bottom quintiles in Panel C (i.e., *PredictedProbability* < 0.217). Our *SuspectedIneffective* definition yields a 10.6 percent suspected IC misreporting rate (=562 ÷ 5,305), which is qualitatively similar to the 9.3 percent suspected IC misreporting rate based on the mean *PredictedProbability* value discussed in relation to Panel B. Our *SuspectedIneffective* definition uses the *PredictedProbability* value at the 20th percentile as a cutoff. We assess the sensitivity of our cost analysis with alternative *PredictedProbability* value cutoffs ranging from the 10th to 30th percentile in Section 5.4.

To further validate this classification, we examine factors expected to be associated with suspected IC misreporting by comparing *SuspectedIneffective* = 1 and *SuspectedIneffective* = 0 observations. These test results are presented in Table 4, Panel D. We first investigate future realizations, beginning with how often managers amend their 404(a) reports to disclose ineffective internal controls. We find that 3.4 percent of suspected IC misreporters eventually amend their 404(a) reports to disclose ineffective internal controls (*Amend404(a)*=1), which is significantly more than the 0.4 percent of credibly effective firms that amend ($p < 0.01$). It is not surprising that we do not observe any 404(a) amendments by firms that originally disclose ineffective internal controls, as it is unlikely a firm would erroneously identify and disclose ineffective internal controls.

We next examine whether suspected IC misreporters are more likely than credibly effective firms, and similarly likely as disclosed ineffective firms, to experience future restatements or stock market performance-related delistings. Turning first to restatements, we set the indicator variable $Restate_t$ equal to one if a firm's year *t* financial statement (the year of the 404 (a) disclosure) is subsequently restated.[24] We find that 16.4 percent of suspected IC misreporters restate their current period

[24] Note that these restatements are not simply capturing 404(a) amendments, as 90 percent of our restatement sample firms do not modify their 404 (a) opinion (untabulated).

Table 4
Prediction Model Validity Tests (Exempt Firms)
Panel A: Determinants of Ineffective Internal Controls

Variables	$DisclosedIneffective_t = 1$ (N=577) Mean	Median	Predicted Diff. (t-test of means)	$DisclosedIneffective_t = 0$ (N=4725) Mean	Median
$AggLoss_{t-1,t}$	0.610	1.000	> ***	0.508	1.000
$Restate_{t-2,t-1}$	0.296	0.000	> ***	0.083	0.000
Seg_t	3.088	2.000	> ***	2.792	2.000
Age_t	2.366	2.398	< ***	2.645	2.708
$BankInd_t$	0.097	0.000	< ***	0.228	0.000
$Size_{t-1}$	3.600	3.627	?	3.603	3.665
$Cash_{t-1}$	0.181	0.106	< ***	0.216	0.111
$InstOwn_{t-1}$	0.077	0.000	< ***	0.117	0.039
$Prior404302_t$	0.830	1.000	> ***	0.068	0.000

Panel B: $PredictedProbability_t$ Values by $DisclosedIneffective_t$ Status

	N	Percent	$PredictedProbability_t$ Mean	SD	P25	P50	P75
$DisclosedIneffective_t = 0$	4725	89.12%	0.145	0.178	0.056	0.089	0.143
$DisclosedIneffective_t = 1$	577	10.88%	0.672	0.263	0.622	0.763	0.850
All Observations	5302	100.00%	0.202	0.250	0.059	0.098	0.178
Test of Differences			t = 63.25***			z = 32.07***	

Panel C: $PredictedProbability_t$ Values by $PredictedProbability_t$ Quintile

	Pooled Sample		$DisclosedIneffective_t = 1$				$DisclosedIneffective_t = 0$			
					$PredictedProbability_t$ Values				$PredictedProbability_t$ Values	
$PredictedProbability_t$ Quintiles	N	Percent	N	Percent	Min	Mean	N	Percent	Min	Mean
1 (highest)	1060	20.0%	498	86.3%	0.231	0.762	562	11.9%	0.217	0.549
2	1060	20.0%	32	5.5%	0.119	0.157	1028	21.8%	0.119	0.156
3	1061	20.0%	20	3.5%	0.081	0.098	1041	22.0%	0.080	0.099
4	1060	20.0%	15	2.6%	0.055	0.063	1045	22.1%	0.054	0.066
5 (lowest)	1061	20.0%	12	2.1%	0.028	0.042	1049	22.2%	0.007	0.041
Total	5302	100.0%	577	100.0%		0.672	4725	100.0%		0.145

Panel D: Factors Associated with Suspected IC Misreporting

	[1] $DisclosedIneffective_t = 1$			[2] $SuspectedIneffective_t = 1$			[3] $CrediblyEffective_t = 1$	
Variables	N	Mean	Pred. Diff.	N	Mean	Pred. Diff.	N	Mean
Future Realizations								
$Amend404(a)_t$	577	0.0%	n/a	562	3.4%	> ***	4163	0.4%
$Restate_t$	577	11.8%	= **	562	16.4%	> ***	4163	3.4%
$DelistPerformance$	577	25.3%	?	562	23.8%	> ***	4163	13.1%
Discovery and Disclosure								
$HighMA_{t-1,t}$	380	5.0%	> **	391	2.3%	< *	2263	4.2%
$Big4_t$	577	11.8%	> +++	561	18.0%	?	4161	20.3%
ΔAud_t	577	26.7%	> ***	562	18.7%	?***	4163	9.1%
Incentives								
$DebtEquityIssuance_t$	577	52.0%	< **	562	57.7%	?***	4163	49.7%
$Zscore_t$	469	1.513	> **	442	0.331	< ***	2622	1.820

Notes: All variables are defined in Appendix C, and all continuous variables are winsorized at the 1st and 99th percentiles by fiscal year. ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively, using two-tailed (one-tailed) p-values for non-directional (directional) predictions. +++ indicates significance in the direction opposite to prediction at the 1% level using a two-tailed p-value.

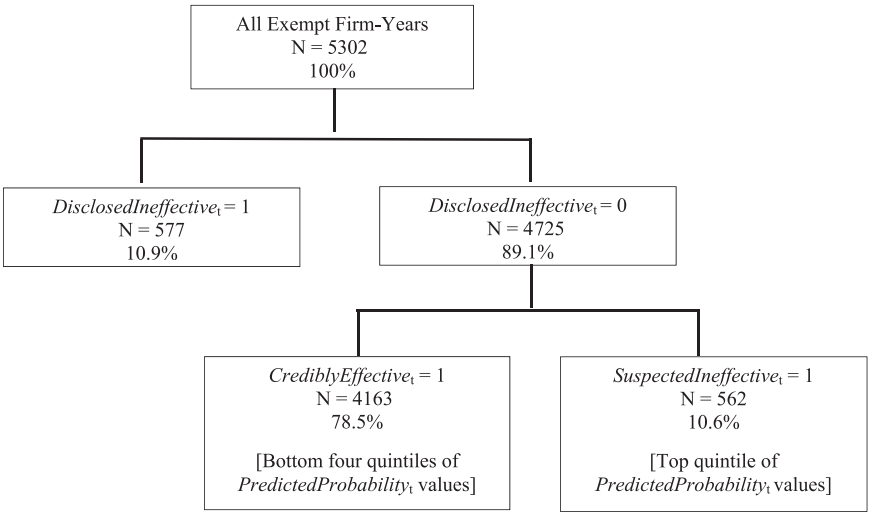

Fig. 2. How Exempt Firms are Classified as *DisclosedIneffective*$_t$, *SuspectedIneffective*$_t$, and *CrediblyEffective*$_t$.
Notes: All variables are defined in Appendix C.

financial statements, whereas only 3.4 percent of credibly effective firms restate. Not only are suspected IC misreporters more likely to restate than credibly effective firms ($p < 0.01$), but their restatement rate is significantly higher than the 11.8 percent restatement rate among firms that disclose ineffective internal controls ($p < 0.05$). Turning to stock exchange delistings, we find that suspected IC misreporters are more likely than credibly effective reporters ($p < 0.01$), and approximately as likely as firms reporting ineffective internal controls ($p > 0.10$), to delist due to poor performance (*DelistPerformance* = 1). These results further validate our model's explanatory power in classifying firms that fail to identify or disclose ineffective internal controls.

We next consider how the accuracy of internal control effectiveness disclosure varies cross-sectionally with managerial ability to discover, and incentives to disclose, weaknesses. The descriptions and predictions for each variable are discussed in Appendix D. Overall, we find that suspected IC misreporters are managed by lower-ability managers, relative to firms that disclose ineffective internal controls ($p < 0.05$). Lower-ability managers are expected to be less capable of discovering internal control issues, so the IC misreporting by these managers may be unintentional. Opposite our expectation, suspected IC misreporters are more likely to have a Big 4 auditor than firms that disclose ineffective internal controls ($p < 0.01$). However, suspected IC misreporters are significantly less likely to experience an auditor change in year t relative to firms that disclose ineffective internal controls ($p < 0.01$). To the extent that new auditors scrutinize a client's internal control disclosures more carefully than continuing auditors do, this result is consistent with the notion that monitoring discourages IC misreporting.

Turning to our incentive variables for IC misreporting, we find that 57.7 percent of suspected IC misreporters issue new debt or equity in year t (*DebtEquityIssuance*$_t$), but only 52.0 percent of firms disclosing ineffective internal controls do the same; this difference is significant ($p < 0.05$). We also find that suspected IC misreporters have significantly lower Z-scores (*Zscore*$_t$) than firms disclosing ineffective internal controls ($p < 0.05$), which indicates higher bankruptcy risk. Taken together, these results suggest that IC misreporting is more likely when managerial ability to discover weaknesses is lower and when incentives to avoid disclosure are stronger; this is consistent with our model identifying suspected IC misreporting.

5.2.3. *Does 404(b) curb internal control misreporting?*

We next gauge the incremental impact of 404(b) on the discovery or disclosure of ineffective internal controls. As shown above, we estimate that while 20.2 percent of exempt firms should disclose ineffective internal controls, only 10.9 percent actually do so, which suggests 9.3 percent of exempt firms are IC misreporters. Rice and Weber (2012) provide evidence that IC misreporting also occurs among accelerated filers that comply with 404(b). Based on Table 3, Panel A, we estimate that while 18.9 percent of non-exempt firms should disclose ineffective internal controls (*MaintainedIneffective* = 1), only 14.4 percent do so (*DisclosedIneffective* = 1). This suggests that 4.5 percent of non-exempt firms are IC misreporters. The 4.5 percent figure represents a lower bound of non-exempt firm IC misreporting, because there are likely to be additional firms that inappropriately disclosed effective internal controls but did not subsequently amend their 404(b) report or experience an internal control-related restatement. Nevertheless, our estimate of 9.3 percent IC misreporting among exempt firms is greater than the 4.5 percent figure for non-exempt firms, and suggests that IC misreporting is materially higher absent Section 404(b).

To more explicitly test whether Section 404(b) reduces inaccurate internal control disclosures, we consider how internal control disclosures change when exempt firms become subject to 404(b). We examine the internal control disclosures of 254 “switchers” (i.e., firms whose filing status changes from exempt to non-exempt) to provide evidence of whether the

Table 5
Does 404(b) Curb the Failure to Discover or Disclose Ineffective Internal Controls?
Panel A: $DisclosedIneffective_{t+1}$ for $SwitchToAF_{t+1}$=1 Observations (N=254)

	[1] $DisclosedIneffective_t = 1$ under 404(a)		[2] $SuspectedIneffective_t = 1$ under 404(a)		[3] $CrediblyEffective_t = 1$ under 404(a)	
Disclosure under 404(b)	N	Percent	N	Percent	N	Percent
$DisclosedIneffective_{t+1} = 0$	15	62.5%	13	61.9%	194	92.8%
$DisclosedIneffective_{t+1} = 1$	9	37.5%	8	38.1%	15	7.2%
Total	24	100.0%	21	100.0%	209	100.0%

Panel B: Modeling $DisclosedIneffective_{t+1}$ as a Function of Firms' Switch to Non-Exempt $Status_{t+1}$ and Model Classification under 404(a) in year t

Variables	Pred.	[1] Y= $DisclosedIneffective_{t+1}$	[2] Y= $DisclosedIneffective_{t+1}$	[3] Y= $DisclosedIneffective_{t+1}$
$SwitchToAF_{t+1}$	+	**1.752*** **	**0.889*** **	**0.712** **
		(3.70)	**(3.75)**	**(2.47)**
$SuspectedIneffective_t$	+			1.034***
				(5.20)
$SwitchToAF_{t+1} \times SuspectedIneffective_t$	+			**1.040** **
				(1.88)
Constant	+/-	-2.237***	-3.086***	-3.271***
		(-13.21)	(-34.68)	(-32.22)
N Y=1		46	168	168
N Observations		415	3550	3550
Sample		$SuspectedIneffective_t = 1$	$SuspectedIneffective_t = 1$ & $CrediblyEffective_t = 1$	$SuspectedIneffective_t = 1$ & $CrediblyEffective_t = 1$
ROC		0.569	0.538	0.603
Standard Errors Clustered		Firm	Firm	Firm

Notes: All variables are defined in Appendix C, and all continuous variables are winsorized at the 1st and 99th percentiles by fiscal year.
***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively, using two-tailed (one-tailed) p-values for non-directional (directional) predictions.

same firm is more likely to disclose ineffective internal controls when subject to 404(b). Although this is a small sample of observations, a benefit of this analysis is that it uses a firm as its own control.

In Table 5, Panel A, we provide univariate comparisons of the 254 switchers' internal controls disclosures in the year prior to and the year of 404(b) compliance. In the year prior to auditor attestation, 21 switchers were classified as suspected IC misreporters. Of these 21, eight (38.1 percent) disclose ineffective internal controls once subject to auditor attestation under 404(b).[25] This suggests that 404(b) compliance curbs suspected IC misreporting by an estimated 38.1 percent.[26] In contrast, of the 209 switchers that credibly disclosed effective internal controls in the year prior to auditor attestation, only 15 (7.2 percent) disclose ineffective internal controls once subject to 404(b).

Our multivariate analysis in Panel B corroborates the Panel A univariate result that Section 404(b) curbs inaccurate internal control disclosures. In Column 1, we consider only the 562 firms identified in year t as suspected IC misreporters. Of these, 415 provide an internal control disclosure in $t+1$ and thus can be included in the analysis. We create an indicator variable, $SwitchToAF_{t+1}$, equal to one for the 21 observations that switched to non-exempt status in year $t+1$. We find that the coefficient on $SwitchToAF_{t+1}$ is positive and significant ($p < 0.01$), consistent with suspected IC misreporters being more likely to disclose ineffective internal controls once subject to 404(b). The coefficient on $SwitchToAF_{t+1}$ is lower in Column 2 (0.889 versus 1.752), where we include all exempt firms that reported effective internal controls in year t instead of only suspected IC misreporters. We formalize this difference in Column 3, where we include main effects for $SwitchToAF_{t+1}$ and $SuspectedIneffective_t$, as well as an interaction between the two variables. The positive and significant coefficient on $SwitchToAF_{t+1}$ illustrates that all firms are more likely to disclose ineffective internal controls once subject to 404(b), and the positive and significant coefficient on $SuspectedIneffective_t$ indicates that firms suspected of IC misreporting under 404(a) in year t are more likely to disclose ineffective internal controls in $t+1$, even if they are not subject to 404(b). The positive and statistically significant coefficient on the interaction term indicates that suspected IC misreporters that become subject to 404(b) are more likely to disclose ineffective internal controls, relative to suspected IC misreporters that continue to be exempt from 404(b). This is consistent with the joint hypothesis that our

[25] We view 38.1 percent as a conservative estimate, as it is likely that firms with known but undisclosed internal control weaknesses remediate prior to the additional scrutiny of Section 404(b).

[26] Thus, IC misreporting after firms become subject to Section 404(b) falls from 9.3 percent to 5.8 percent (= 0.093 × (1–0.381)) which is closer to the 4.5 percent IC misreporting among the non-exempt firm-years we examine. DeFond and Lennox (2017) find that IC misreporting among non-exempt firms has declined in more recent years, suggesting that 404(b) compliance may curb more than 38.1 percent.

model identifies IC misreporters and that 404(b) improves disclosure accuracy. Note that our Table 5 analyses are within the AS5 audit regime, so the benefit of 404(b) is present even in the absence of the more rigorous attestation procedures of AS2.

5.3. Estimating costs of 404(b) exemption

In this section, we estimate two costs of 404(b) exemption based on our identification of suspected IC misreporters and the extent that this IC misreporting is curbed by Section 404(b). The first is the cost of failing to remediate ineffective internal controls. Prior research documents that firms that publicly disclose ineffective internal controls tend to remediate these material weaknesses and experience a subsequent improvement in operating performance (Feng et al., 2015). To the extent that IC misreporters do not discover and disclose their internal control weaknesses, they are not expected to remediate these issues. Thus, lower operating performance due to non-remediation is a cost of exemption. To empirically assess whether this actually occurs, we examine the differences in future return on assets (ROA) between suspected IC misreporters, firms that disclose and remediate ineffective internal controls, and firms that disclose but fail to remediate ineffective internal controls.

We present univariate comparisons in Table 6, Panel A and provide medians to avoid the influence of outliers. In year $t+1$, the ROA of credibly effective disclosers is statistically higher than the ROA of suspected IC misreporters. In contrast, suspected IC misreporters and firms that disclose ineffective internal controls report negative ROAs that are statistically indistinguishable. These findings are consistent with suspected IC misreporters inaccurately disclosing their internal control status, on average. Firms disclosing ineffective internal controls report improved ROA values in years $t+2$ and $t+3$, consistent with operating performance improving upon remediation of these weaknesses. However, suspected IC misreporters continue to report negative ROA in years $t+2$ and $t+3$, consistent with these firms failing to remediate their internal control weaknesses, on average. Inferences are similar using a constant sample of observations from $t+1$ to $t+3$ (untabulated).

Instead of assuming that the entire ROA differential between suspected IC misreporters and firms that disclose ineffective internal controls is a result of remediation, we present a multivariate analysis in Table 6, Panel B, which tabulates firms' change in ROA from year t to $t+3$. Although we do not capture the cost of remediation directly, these costs will generally flow through ROA (e.g., depreciation expense of a new internal control system, SG&A related to employee time spent implementing new controls, etc.). We include the control variables that could explain firms' changes in ROA from Feng et al. (2015). Column 1 of Panel B provides evidence that firms disclosing ineffective internal controls experience a 3.3 percent improvement in ROA ($p < 0.05$), whereas suspected IC misreporters experience no improvement ($p > 0.10$). Column 2 corroborates our expectations that ROA improves more within firms that disclose ineffective internal controls and remediate them in the following year ($Remediate_{t+1}$ coefficient=0.047; $p < 0.05$), relative to both firms that disclose but do not remediate ineffective internal controls ($NoRemediate_{t+1}$) and to suspected IC misreporters. Using the change in industry-adjusted ROA from t to $t+3$ as the dependent variable yields similar inferences (untabulated).

It is possible that poor financial reporting quality could confound the estimates in Columns 1 and 2, given that firms with ineffective internal controls tend to have lower-quality reported earnings (e.g., Doyle et al., 2007b). To mitigate this concern, we remove the 269 observations that subsequently restate their year t or $t+3$ financial statements and present the results based on this restricted sample in Columns 3 and 4. The *DisclosedIneffective* (*Remediate*) coefficient in Column 3 (4) remains statistically significant ($p < 0.05$ for both). Both coefficients appear larger in magnitude than results for the full sample of observations (Columns 1 and 2, respectively). This is consistent with some suspected IC misreporters overstating future reported earnings, which introduces a downward bias to our cost estimate.

In Table 6, Panel C, we calculate the aggregate dollar value of the lower operating performance due to firms failing to discover or disclose and then remediate ineffective internal controls. We estimate the cost of lower operating performance by considering the difference between the change in ROA for firms that disclose ineffective controls and for suspected IC misreporters, reported in Column 1 of Table 6, Panel B. The difference is reflected in the *DisclosedIneffective* coefficient (0.033) because the *SuspectedIneffective* coefficient is not statistically different from zero ($p > 0.10$).[27] Thus, the "cost" of suspected IC misreporters failing to identify and disclose ineffective internal controls is 3.3 percent of total assets over three years. We convert total assets of suspected IC misreporters into 2014 real dollars so that our cost calculation is directly comparable to our benefits calculation (which measures incremental audit fees in 2014 real dollars). The 426 non-overlapping suspected IC misreporters have average assets of $159.9 million.[28] Thus, a 3.3 percent increase in assets translates to lower operating performance of $5.3 million in the three years following the suspected IC misreporting. Since we estimate that 404(b) eliminates only 38.1 percent of IC misreporting (see Section 5.2.3), lower operating performance amounts to 38.1 percent of this cost, or $2.0 million per firm. Although suspected IC misreporters' lower operating performance is realized from t through $t+3$, it is only statistically different from *DisclosedIneffective* firms in year $t+3$. Thus, we discount the cost estimate from year $t+3$, applying a six percent discount rate and estimate that suspected IC misreporters forgo future earnings with a present value of $1.7 million.[29] Multiplying this per-firm value by the 426 non-overlapping suspected IC

[27] Using the difference between the *DisclosedIneffective* coefficient of 0.03 and the *SuspectedIneffective* coefficient of 0.003 yields similar inferences (untabulated).

[28] We remove 136 of the 562 $SuspectedIneffective_t = 1$ observations also classified as a suspected IC misreporter in $t+1$ through $t+3$ to avoid double-counting a firm during the $\Delta ROA_{t,t+3}$ time period.

[29] We select a six percent discount rate following Erickson et al. (2004). CFO perceptions of equity discount rates (Graham and Harvey, 2010) and estimates by academics during our cost estimate time period (e.g., http://pages.stern.nyu.edu/~adamodar/; last accessed November 21, 2016) yield a

Table 6
Costs of 404(b) Exemption (Exempt Firms)
Panel A: Future ROA by Internal Control Reporting Classification

	[1] *DisclosedIneffective*$_t$ = 1			[2] *SuspectedIneffective*$_t$ = 1			[3] *CrediblyEffective*$_t$ = 1	
Variables	N	Median	Test of Diff.	N	Median	Test of Diff.	N	Median
ROA_{t+1}	486	-2.76%	n.s.	504	-3.19%	***	3,715	0.39%
ROA_{t+2}	375	-0.84%	n.s.	406	-2.35%	***	3,044	0.51%
ROA_{t+3}	282	-0.26%	**	312	-1.85%	***	2,395	0.62%

Panel B: Assessing the Operating Performance Cost of Non-Remediation

Variables	Pred.	[1] Y= $\Delta ROA_{t,t+3}$	[2] Y= $\Delta ROA_{t,t+3}$	[3] Y= $\Delta ROA_{t,t+3}$	[4] Y= $\Delta ROA_{t,t+3}$
SuspectedIneffective$_t$	?	0.003	0.002	0.007	0.007
		(0.18)	(0.16)	(0.42)	(0.40)
DisclosedIneffective$_t$	+/-	**0.033****		**0.037****	
		(2.08)		**(2.02)**	
Remediate$_{t+1}$	+		**0.047****		**0.055****
			(2.08)		**(2.16)**
NoRemediate$_{t+1}$	+/-		0.018		0.015
			(0.85)		(0.59)
SalesGrowth$_{t-2\ to\ t}$	+	-0.022***	-0.021***	-0.022**	-0.022**
		(-2.82)	(-2.79)	(-2.53)	(-2.50)
ROA_{t-1}	–	-0.102***	-0.100***	-0.105***	-0.104***
		(-2.75)	(-2.70)	(-2.64)	(-2.59)
Loss$_t$	?	0.078***	0.078***	0.077***	0.076***
		(7.51)	(7.48)	(6.72)	(6.69)
Size$_t$	+	-0.001	-0.001	0.001	0.000
		(-0.13)	(-0.17)	(0.14)	(0.08)
Constant	+/-	-0.017	-0.017	-0.026	-0.025
		(-0.63)	(-0.61)	(-0.88)	(-0.86)
$B_1=\beta_2$		F=2.40*	–	F=1.69*	–
$B_1=\beta_3$		–	F=3.11**	–	F=2.76**
N *SuspectedIneffective* = 1		305	305	237	237
N *DisclosedIneffective* = 1		272	272	223	223
N *Remediate* = 1		–	119	–	103
Total N		2,888	2,888	2,619[a]	2,619
Adjusted R^2		0.096	0.096	0.096	0.096
Fixed effects		Ind. & Yr.	Ind. & Yr.	Ind. & Yr.	Ind. & Yr.
Standard errors clustered by		Firm	Firm	Firm	Firm

Panel C: Cost Estimate of Suspected IC Misreporters' Lower Operating Performance Attributed to 404(b) Exemption

3.30%	Average $\Delta ROA_{t,t+3}$ for *DisclosedIneffective* = 1 observations (Table 6, Panel B, Column 1, β_2)
–0.00%	Average $\Delta ROA_{t,t+3}$ for *SuspectedIneffective* = 1 observations (Table 6, Panel B, Column 1, β_1)
3.30%	Incremental difference in $\Delta ROA_{t,t+3}$ attributed to disclosing ineffective and remediating
× $159,905,000	× Mean assets$_t$ for *SuspectedIneffective*$_t$ = 1 observations
$5,276,865	Per-firm foregone operating improvements attributed to suspected IC misreporters' inaccurate internal control disclosure
× 38.1%	× Reduction in IC misreporting attributed to 404(b) compliance (Table 5, Panel A, Column 2)
$2,010,486	Per-firm foregone operating improvements attributed to suspected IC misreporters' inaccurate internal control disclosures due to 404(b) exemption
÷ $(1.06)^3$	Present value adjustment (three years at six percent)
$1,688,042	Per-firm present-value of foregone operating improvements attributed to suspected IC misreporters' inaccurate internal control disclosures due to 404(b) exemption
× 426	*SuspectedIneffective*$_t$ = 1 observations[b]
$719,106,083	Aggregate present-value of foregone operating improvements attributed to suspected IC misreporters' inaccurate internal control disclosures due to 404(b) exemption

Panel D: Future Abnormal Returns by Internal Control Reporting Classification

	[1] $DisclosedIneffective_t = 1$			[2] $SuspectedIneffective_t = 1$			[3] $CrediblyEffective_t = 1$	
Variables	N	Median	Test of Diff.	N	Median	Test of Diff.	N	Median
$AbRet_{t+1}$	403	-28.99%	***	434	-17.84%	**	3111	-8.33%
$AbRet_{t+1 \text{ through } t+2}$	403	-48.40%	***	434	-30.53%	***	3111	-12.01%
$AbRet_{t+1 \text{ through } t+3}$	403	-56.08%	**	434	-43.66%	***	3111	-12.87%
$AbRet_{t+1 \text{ through } t+4}$	403	-60.00%	n.s.	434	-55.04%	***	3111	-9.81%

Panel E: Cost Estimate of Suspected IC Misreporters' Delayed Decline in Market Values Attributed to 404(b) Exemption

56.08%	Median negative $AbRet_{t+1 \text{ through } t+3}$ for *DisclosedIneffective* = 1 observations (Table 6, Panel D)
× 43.66%	– Median negative $AbRet_{t+1 \text{ through } t+3}$ for *SuspectedIneffective* = 1 observations (Table 6, Panel D)
12.42%	Incremental difference in median negative $AbRet_{t+1 \text{ through } t+3}$ attributed to IC misreporting
× $46,380,000	× Mean market value$_t$ for *SuspectedIneffective* = 1 observations
$5,760,396	Per-firm delayed decline in market value attributed to suspected IC misreporters' inaccurate internal control disclosures
× 38.10%	× Reduction in IC misreporting attributed to 404(b) compliance (Table 5, Panel A, Column 2)
$2,194,711	Per-firm delayed decline in market value attributed to suspected IC misreporters' inaccurate internal control disclosures due to 404(b) exemption
× 426	× $SuspectedIneffective_t = 1$ observations[b]
$934,946,833	Aggregate delayed decline in market values attributed to suspected IC misreporters' inaccurate internal control disclosures due to 404(b) exemption

Notes: All dollar values are presented in 2014 real dollars. All variables are defined in Appendix C, and all continuous variables are winsorized at the 1st and 99th percentiles by fiscal year. ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively, using two-tailed (one-tailed) p-values for non-directional (directional) predictions.

[a] The sample decreases in Columns 3 and 4 because we remove the 269 observations that subsequently restate their year t or $t+3$ financial statements.

[b] We remove 136 of the 562 $SuspectedIneffective_t=1$ observations also classified as a suspected IC misreporter in $t+1$ through $t+3$ to avoid double-counting a firm during the $\Delta ROA_{t,t+3}$ time period.

misreporters yields an aggregated cost of $719.1 million. Undiscounted foregone earnings are $2.0 million per suspected IC misreporter and $866 million in the aggregate. This cost is borne by IC misreporter shareholders. It is possible that lower operating performance extends beyond year $t+3$, which would suggest that our cost estimate is conservative.

We conduct multiple sensitivity analyses in relation to this cost estimate. Re-calculating Table 6, Panel C using the 3.7 percent difference in $\Delta ROA_{t,t+3}$ from the sample of firms without restatements (Table 6, Panel B, Column 3) yields an estimated $960 million in aggregate lower operating performance (untabulated). An alternative way to address the potential concern of financial reporting quality confounding our analyses is to examine cash from operations in place of net income. Doing this continues to yield a positive and significant *DisclosedIneffective* coefficient (in Column 3, $\beta_2=0.023$, $p<0.05$; untabulated). This improvement continues to be concentrated within remediation firms (in Column 4, $\beta_2=0.034$, $p<0.05$; untabulated).

The second cost is market values failing to reflect firms' underlying internal control status. Long-term future abnormal stock returns ($AbRet_{t+1,t+i}$) are measured using buy-and-hold, size-adjusted returns calculated over one- to four-year periods, beginning on the first day of the fiscal year $t+1$ so the return period includes the year t internal control status announcement. Abnormal returns reflect when the suspected IC misreporters' poor performance is impounded into stock price by investors. As a large percentage of exempt firms delist (see Table 4, Panel D), we include firms' delisting returns in our return calculations. To capture the valuation impact of the disclosure, we first calculate $AbRet_{t+1}$, which includes the period in which a firm discloses its internal control effectiveness in its Form 10-K. Table 6, Panel D shows that the median suspected IC misreporter experiences a –17.8 percent abnormal return in $t+1$. This is larger than the –8.3 percent abnormal return for the median credibly effective firm ($p<0.05$), but smaller than the –29.0 percent abnormal return for the median firm that discloses ineffective internal controls ($p<0.01$).

To the extent that the difference in $t+1$ returns between suspected IC misreporters and firms disclosing ineffective internal controls is attributable to the knowledge of ineffective internal controls, this provides an estimate of the cost of the failure to disclose ineffective internal controls. If so, we expect returns to converge over the next few years as the costs related to ineffective internal controls are realized among suspected IC misreporters. If we have misidentified suspected IC misreporters, we would not expect such a convergence.

We present the cumulative returns for years $t+1$ through $t+i$, where i is equal to two through four, in Panel D. The cumulative returns continue to be significantly different between the two groups in $t+2$ and $t+3$. By four years after the

(*footnote continued*)
qualitatively similar discount rate (untabulated).

suspected IC misreporter disclosure omission, the cumulative returns of the two groups converge (i.e., they are statistically indistinguishable). Thus, we attribute the –12.42 percent differential in abnormal cumulative returns from $t+1$ through $t+3$ between suspected IC misreporters and firms that disclose ineffective internal controls (–43.66 versus –56.08 percent) to the failure to disclose ineffective internal controls. Removing observations that delist due to performance reasons yields similar inferences in abnormal return differences between the two groups (untabulated).

We do not conduct a multivariate analysis for the returns tests as these returns are size-adjusted and we do not expect current returns to predict future returns. We note that negative future abnormal returns likely occur as investors learn about the negative future outcomes of IC misreporters (e.g., stock delistings, restatements, or lower ROA). Although these negative returns might be avoidable with remediation, we do not assert that truthful internal control disclosures would prevent them. We argue only that disclosure allows the negative returns to be realized sooner.

To quantify this disclosure timeliness cost of IC misreporting, in Table 6, Panel E we multiply the –12.42 percent difference in $t+1$ through $t+3$ abnormal returns between suspected IC misreporters and firms reporting ineffective controls with the $46.4 billion aggregate market value (in 2014 real dollars) for the 426 suspected IC misreporters measured at the beginning of year $t+1$.[30] This calculation yields a $5.8 million estimate of the cost per firm due to the failure to disclose ineffective internal controls. As we estimate that 404(b) compliance would curb only 38.1 percent of the IC misreporting (Section 5.2.3), these disclosure costs are expected to fall by 38.1 percent if exempt firms were subject to 404(b). Thus, we estimate that the cost of failing to disclose ineffective internal controls is $2.2 million per firm.

Although it is possible that some of these negative returns would be avoided with material weakness remediation, we assert that in general these negative stock returns would simply be recognized sooner with 404(b) compliance. In contrast, we argue our estimate of lower operating performance realized by year $t+3$ is avoidable with 404(b) compliance. As such, the cost of failing to disclose ineffective internal controls is largely borne by investors who purchased shares after the firm misreported its internal control effectiveness.

5.4. Sensitivity analysis and overall discussion of the benefits and costs of 404(b) exemption

Taken together, our findings suggest that 404(b) exemption saves the firms in our sample an aggregate $388 million in audit fees from 2007 through 2014. However, costs of 404(b) exemption include an aggregate $719 million in lower operating performance and the delay of an aggregate $935 million market value decline in the three years following suspected IC misreporters failing to disclose ineffective internal controls. These estimates provide insight into the potential tradeoffs of exemption.

It is important to assess how sensitive our estimates are as our inferences necessarily rely on empirical design choices. Thus, in Table 7 we present bounds of our estimates conditional on different choices. In Table 7, Panel A, we consider two additional size thresholds to infer "incremental" audit fees of non-exempt firms. Our main analysis in Table 2 conditions on non-exempt firms with $300 million or less in market capitalization; these results are reproduced in Column 1 of Table 7, Panel A. We present analogous estimates comparing exempt firms to non-exempt firms with market capitalizations of $150 ($200) million or less in Column 2 (3). The expected benefit of exemption across all three samples ranges from $354 million to $463 million.

In Table 7, Panel B we consider how our cost estimates vary based on the threshold at which to classify firms as suspected IC misreporters. In our main analysis we define suspected IC misreporters as firms with $DisclosedIneffective_t = 1$ in the top 20th percentile of *PredictedProbability* values. As we move the threshold from the 10th to the 30th *PredictedProbability* percentile in increments of five, Panel B shows that the number of suspected IC misreporters varies from 192 to 1,077 observations, or 3.6 to 20.3 percent of exempt firm-years in our sample. Panel B also illustrates how our cost estimates change based on these alternative thresholds. The estimated costs in Table 7, Panel B provide assurance that the costs of exemption continue to be notably higher than the audit fee savings associated with exemption, regardless of threshold. It is important to note that the 20th percentile threshold classifies 10.6 percent of firms as suspected IC misreporters, which is nearest to the 9.3 percent IC misreporting suggested by our prediction model, providing support for using the 20th percentile threshold in our primary tests.

Several caveats are in order. First, although the estimated audit fees saved in year t benefit the firm in years t through $t+3$, and thus are comparable to our present-valued lower operating performance cost estimate, these two estimates are not directly comparable to the decline in market value because inaccurate internal control disclosure merely delays the market value declines. It is also possible, however, that IC misreporting cultivates conditions that increase the likelihood of future misstatement (see Table 4, Panel D), as firms that do not discover ineffective internal controls cannot remediate them. To the extent that future misstatements are revealed during our stock return accumulation period, the decline in market value we document captures some incremental loss of firm value as a result of IC misreporting.

Second, as described previously and presented in Appendix A, there are other potential benefits and costs of 404 (b) exemption, such as employee time, litigation risk, and financial reporting quality (and its associated impact on cost of capital). To the extent these factors influence firms' operating or stock performance in years $t+1$ through $t+3$, they are included in our cost estimates. However, our cost estimates omit the impact of these factors beyond $t+3$.

[30] As in our estimated cost of foregone operating improvements, we remove 136 of the 562 $SuspectedIneffective_t = 1$ observations also classified as a suspected IC misreporter in $t+1$ through $t+3$ to avoid double-counting firms during the $AbRet_{t+1 \text{ through } t+3}$ time period.

Table 7
Bounds of Benefits and Costs Estimates
Panel A: Benefits Bounds Based on Non-Exempt Firms Identified Using Different Size Thresholds

	404(a) & (b) compliance year	*Non-exempt firms with market capitalization ≤ $300M (from Table 2, Panel A)*		Non-exempt firms with market capitalization ≤ $150M		Non-exempt firms with market capitalization ≤ $200M	
Year		N	Mean audit fees	N	Mean audit fees	N	Mean audit fees
2003	–	*450*	*$430,200*	193	$350,730	284	$361,036
2004	1	*451*	*$939,069*	172	$866,313	288	$890,234
2005	2	*632*	*$781,082*	242	$694,641	409	$718,713
2006	3	*640*	*$736,527*	269	$662,854	409	$667,638
2007	4	*1,029*	*$802,143*	529	$670,451	754	$731,818
2008	5	*1,225*	*$926,090*	769	$862,700	938	$866,473
2009	6	*778*	*$759,951*	362	$632,044	502	$670,568
2010	7	*627*	*$656,036*	241	$540,578	382	$590,448
2011	8	*761*	*$700,294*	339	$574,168	499	$624,538
2012	9	*677*	*$715,203*	274	$581,342	431	$630,167
2013	10	*518*	*$663,080*	176	$464,357	291	$555,646
2014	11	*585*	*$697,999*	258	$558,064	366	$610,747
%Δ for non-exempt firms (2003–2014)			*62.25%*		59.11%		69.17%
–%Δ for exempt firms (2003–2014) (Table 2, Panel A)			*-26.53%*		*-26.53%*		*-26.53%*
Incremental %Δ			*35.72%*		32.58%		42.64%
× Mean exempt firms' 2003 audit fees (Table 2, Panel A)			*x $204,830*		*x $204,830*		*x $204,830*
Annual incremental cost of 404(b) compliance			*$73,165*		$66,744		$87,330
× Exempt firm-years in our sample (2007–2014)			*x 5302*		*x 5302*		*x 5302*
Aggregate incremental cost of 404(b) compliance			***$387,963,246***		**$353,875,800**		**$463,021,148**

Panel B: Costs Bounds Based on Alternative Thresholds Used to Classify Suspected IC Misreporters

	Top 20th Percentile *(from Table 4, Panel C)*	Top 10th Percentile	Top 15th Percentile	Top 25th Percentile	Top 30th Percentile
PredictedProbability cutoff to classify *SuspectedIneffective* = 1	*0.217*	0.737	0.469	0.178	0.152
Suspected IC Misreporters using alternative threshold (N)	*562*	192	319	818	1,077
Suspected IC Misreporters using alternative threshold (%)	*10.6%*	3.6%	6.0%	15.4%	20.3%
Lower operating performance:					
($\beta_2 - \beta_1$) from Table 6, Panel C, Column 1	*3.3%*	*3.3%*	*3.3%*	*3.3%*	*3.3%*
× Aggregate assets$_t$ for *SuspectedIneffective*=1	*x 68,120M*	x 27,317M	x 54,636M	x 79,258M	x 88,145M
× Reduction in IC misreporting due to 404(b)	*x 38.1%*	*x 38.1%*	*x 38.1%*	*x 38.1%*	*x 38.1%*
Estimated cost	*$856M*	$343M	$687M	$997M	$1,108M
÷ Present value adjustment	÷ 1.06^3	÷ 1.06^3	÷ 1.06^3	÷ 1.06^3	÷ 1.06^3
Present value of estimated cost	*$719M*	$288M	$577M	$837M	$930M
Delayed decline in market values:					
Diff in AbRet$_{t+1 \text{ through } t+3}$ from Table 6, Panel E	*12.42%*	*12.42%*	*12.42%*	*12.42%*	*12.42%*
× Aggregate market value$_t$ for *SuspectedIneffective*=1	*x 19,758M*	x 8,519M	x 14,316M	x 24,657M	x 29,458M
× Reduction in IC misreporting due to 404(b)	*x 38.1%*	*x 38.1%*	*x 38.1%*	*x 38.1%*	*x 38.1%*
Estimated cost	*$935M*	$403M	$677M	$1,167M	$1,394M

Notes: All dollar values are presented in 2014 real dollars. In Panel A, market capitalization is defined as stock price per share (PRCC_F) multiplied by number of common shares outstanding at year end (CSHO). In Panel B, we remove 136 of the 562 *SuspectedIneffective*$_t$=1 observations also classified as a suspected IC misreporter in $t+1$ through $t+3$ when estimating the two costs of IC misreporting to avoid double-counting a firm during this three-year time period. All variables are defined in Appendix C and all continuous variables are winsorized at the 1st and 99th percentiles by fiscal year.

Third, we attribute differences in audit fees from 2003 to 2014 between exempt and non-exempt firms to 404 (b) compliance. The use of such a long measurement period makes it difficult to attribute observed changes to a specific regulatory event, such as 404(b) (Leuz and Wysocki, 2016). However, we take comfort in our finding that both firms that switch from exempt to non-exempt status and exempt firms that begin to voluntarily comply experience a similar percentage increase in audit fees in the initial year of their 404(b) audit.

Fourth, we attribute differences in future changes in earnings and stock returns between firms disclosing ineffective internal controls and suspected IC misreporters to IC misreporting. It is possible that suspected IC misreporters are systematically different from firms that disclose ineffective internal controls, and that they experience lower future earnings and declines in market values for reasons other than IC misreporting. As we document that IC misreporting is associated with managers' incentives and ability to discover and disclose ineffective internal controls, as well as ex-post amendments of firms' original 404(a) opinions, it is unclear what these systematic differences would be. Thus, we conclude that IC misreporting appears to at least partially contribute to these measured benefits and costs of exemption.

Finally, we study the benefits and costs of 404(b) exemption from a shareholder perspective. Determining whether exemption maximizes social welfare (see Minnis and Shroff, 2017 for a discussion of the economic theory of regulation) is beyond the scope of our paper. Because the costs of exemption are borne by a small subset of investors (an estimated 9.3 percent of exempt firms), whereas the benefits of exemption are realized by investors of all exempt firms, it is difficult to make normative statements about the overall net cost or benefit of 404(b) exemption even from a shareholder perspective.

6. Conclusion

We use non-accelerated filers' permanent exemption from Section 404(b) as a setting to examine benefits and costs of regulation from a shareholder perspective. We estimate that exempt firms in our sample save an aggregate $388 million in audit fees from 2007 through 2014. To assess the costs of Section 404(b) exemption, we develop a model of internal control effectiveness using the smallest firms subject to 404(b), and apply the model coefficients to exempt firms. We estimate that 20.2 percent of exempt firms should disclose ineffective internal controls, but only 10.9 percent do so. Thus, we infer that 9.3 percent of exempt firms maintain *ineffective* internal controls but erroneously disclose *effective* internal controls. We assert that IC misreporting would fall from 9.3 to 5.8 percent if these exempt firms were subject to 404(b). We estimate the costs of 404(b) exemption for suspected IC misreporters as $719 million in lower operating performance due to non-remediation and $935 million delay in aggregate market value decline due to the failure to disclose ineffective internal controls.

It is somewhat puzzling that the managers of IC misreporters would incur such high net costs, especially given that insider ownership exceeds 20 percent in these firms (untabulated). It is likely that managers are not fully aware of the ramifications of ineffective internal controls on their firm's operations. For example, in a survey of corporate insiders by Alexander et al. (2013), only 29.1 percent felt that Section 404 might have a positive effect on the efficiency of their company's operation, whereas approximately as many felt it hurt their company's operation. We leave an assessment of whether managers appear to exhibit evidence of learning over time regarding the benefits of 404 to future work.

Our study contributes to the ongoing debate regarding benefits and costs of exempting firms from Section 404(b). Although many investor advocacy groups disapproved of this exemption (CFA, 2011), Congress has expanded the exemption to additional firms (U.S. Congress, 2012) and continues to consider legislation that would further expand the exemption (U.S. Congress, 2011, 2016a, 2016b). For example, as of December 2016, Congress is considering a proposed bill exempting firms with a market value of less than $250 million from 404(b) compliance (U.S. Congress, 2016b). Our study contributes to this debate by generating estimates of benefits and costs of the 404(b) exemption. We also contribute to the literature by providing auditors, analysts, and investors with a prediction model that can identify the subgroup of firms most likely to have failed to discover or disclose ineffective internal controls.

Acknowledgements

We appreciate comments and suggestions received from Michelle Hanlon (the editor), Suraj Srinivasan (the reviewer), Katharine Adame, Bill Baber, Joe Carcello, Asher Curtis, Dawn Matsumoto, Linda Myers (FARS Mid-Year Meeting discussant), Zoe-Vonna Palmrose, Katherine Schipper (PCAOB/JAR Conference discussant), Jaime Schmidt, Marcy Shepardson, Nemit Shroff, Hollis Skaife, Quinn Swanquist, Brandon Szerwo, Kristen Valentine, and participants at Boston College, the FARS Mid-Year Meeting, Georgetown University, Georgia State University, Indiana University's auditing reading group, the PCAOB/JAR Conference on Auditing and Capital Markets, the Conference on the Convergence of Financial and Managerial Accounting (Temple University), the University of Tennessee, the University of Texas–Austin, and the Washington Area Research Symposium. We thank Sarah Rice, Dave Weber, and Biyu Wu for sharing their data on firms that disclose effective controls and subsequently restate their financial statements due to an error stemming from ineffective internal controls. Ge and McVay would like to thank the Moss Adams Professorship and Deloitte and Touche Professorship, respectively, at the University of Washington for financial support. Koester would like to thank Georgetown University's Center for Financial Markets and Policy for financial support.

Appendix A

Possible Benefits and Costs of 404(b) Exemption

Possible benefits of 404 (b) exemption	Who reaps the benefits?	Can the dollar amount be separately measured?	If measurable, what are the underlying assumptions? If not measurable, why?
(1) Audit fee savings	Current shareholders	Yes	We attribute the incremental audit fee percentage increase between non-exempt and exempt firms to 404(b) compliance. To address the potential concern that the incremental increase in audit fees is due to systematic differences between exempt and non-exempt firms, we consider two alternative benchmarks that use a firm as its own control: firms that switch from exempt to non-exempt status and firms that voluntarily comply with 404(b).
(2) Preserving management and employee time that would otherwise be spent with auditors during the 404(b) engagement	Current shareholders	No	While it is likely that additional employee time is preserved if less comprehensive internal control testing is conducted when firms comply with 404(a) but not 404(b), it is difficult to separately estimate this benefit. Note however, that this benefit should be captured within operating performance and stock returns.
(3) Lower litigation risk to the extent that auditor-provided internal control disclosures are used by plaintiffs as evidence of misbehavior (Coates and Srinivasan, 2014)	Current shareholders	No	It is difficult to disentangle the litigation effects associated with ineffective internal controls, as these will often coincide with other events such as restatements and large stock price drops. Moreover, it is not clear whether complying with 404(b) would necessarily reduce litigation risk. It is also possible that 404(b) exemption leads to a higher litigation risk because a firm's ineffective internal controls are less likely to be remediated, and therefore more likely to lead to litigation-triggering events such as restatements. To the extent it occurs in the next three years, litigation is captured within operating performance and stock returns.
Possible costs of 404 (b) exemption	**Who bears the costs?**	**Can the dollar amount be separately measured?**	**If measurable, what are the underlying assumptions? If not measurable, why?**
(1) Lower operating performance due to non-remediation	Current shareholders	Yes	We measure operating performance costs using three-year changes in future earnings. We show that, for firms disclosing and remediating ineffective internal controls, the improvement in three-year-ahead earnings is driven by remediation. This improvement is already net of management and employee time spent implementing 404(b) as well as remediation costs (e.g., system implementation fees). Thus, such foregone earnings improvements are a cost for misreporters. This measure includes the impact of IC misreporting on costs such as legal fees, employee time, and cost of capital and thus the ability to invest during the three years following IC misreporting.
(2) Market values that fail to reflect a firm's underlying internal control status	Largely borne by new investors relying on inaccurate internal controls disclosures	Yes	We quantify the delayed market value decline using the difference in abnormal stock returns from $t+1$ through $t+3$ between suspected IC misreporters and firms reporting ineffective controls, under the assumption that this difference is driven by inaccurate disclosure of internal control effectiveness by IC misreporters.
(3) Lower earnings quality	Current and prospective shareholders	No	Prior research has documented that auditors are largely able to "audit around" ineffective internal controls, mitigating effects of internal controls on earnings quality (e.g., Doyle et al., 2007a). Because it is difficult to disentangle the effects of internal controls from auditors' substantive testing on earnings quality, we do not consider financial reporting quality as a measurable cost of 404 (b) exemption, although we provide indirect evidence with future restatements.
(4) Actions to avoid compliance threshold	Current shareholders	Partially	Gao et al. (2009) provide evidence of managers undertaking actions if their firm approaches the $75 million public float exemption threshold (e.g., making cash payouts to shareholders, making bad news disclosures, and reporting lower earnings). We do not consider these costs directly because they apply only to firms approaching the $75 million public float exemption threshold. Note, however, that these costs should be at least partially captured within operating performance and stock returns (i.e., inefficient actions would lower these values, whereas avoiding unnecessary regulation would increase these values).

Appendix B

Descriptive Analysis of Ineffective Internal Controls by Type

Table B1 reports frequencies for the four most common general and account-specific weaknesses disclosed by exempt firms from 2007 through 2014; summed values exceed 100 percent because an individual firm can disclose multiple weaknesses. We report analogous frequencies for these same eight weaknesses for the smallest accelerated filers and all other accelerated filers during the AS2 regime.

The descriptive evidence presented in this panel indicates five points worth noting. First, exempt firms are more likely to disclose accounting personnel issues (67.4 percent) than the smallest accelerated filers and all other accelerated filers (55.8 and 52.2 percent, respectively). Second, exempt firms are also more likely to disclose weaknesses related to segregation of duties (34.5 percent) relative to the smallest and all other accelerated filers (21.5 and 15.9 percent, respectively). Implementing controls to address such issues requires hiring additional and expensive accounting personnel. Thus, the evidence is consistent with smaller firms having limited resources to allocate to internal controls (Ge and McVay, 2005; Ashbaugh-Skaife et al., 2007; Doyle et al., 2007b). Third, exempt firms are less likely to have material/numerous auditor or year-end adjustments (48.9 percent) relative to the smallest and all other accelerated filers (70.9 and 67.1 percent, respectively). This difference might be due to less effective auditor oversight of exempt firms. Fourth, exempt firms are less likely to disclose information that identifies the underlying causes of their internal control weaknesses (41.1 percent) than are the smallest and all other accelerated filers (7.2 and 3.1 percent, respectively). Because Section 404(a) requires firms to discuss the nature and types of weaknesses identified, this finding is consistent with lower disclosure quality among smaller firms. Finally, exempt firms disclose fewer material weaknesses related to revenue recognition and cost of sales (15.3 to 17.3 percent) than are the smallest and all other accelerated filers (22.4 to 31.5 percent). This pattern is consistent with smaller firms being less affected by internal control weaknesses associated with complex transactions.

Table B1
Most Frequent Types of Disclosed Material Weaknesses in Internal Control.

	Exempt Firms *(Non-Accelerated Filers < $75 M public float)* (2007–2014, N=577)	**Non-Exempt Firms** *(Accelerated Filers ≤ $300 M MVE)* (2004–2006, N=251)	**All Other Accelerated Filers** *(Accelerated Filers > $300 M MVE)* (2004–2006, N=584)
General issues			
Accounting personnel (resources, competency, training)	67.42%	55.78%	52.23%
Material/numerous auditor or year-end adjustments	48.87%	70.92%	67.12%
Insufficient information to identify cause of weakness	41.07%	7.17%	3.08%
Personnel: segregation of duties and design of controls	34.49%	21.51%	15.92%
Account-specific issues			
Accounts/loans receivable, investments, and cash	18.72%	29.48%	22.43%
Inventory, vendor, and/or cost of sales	17.33%	28.29%	22.43%
Revenue recognition	15.25%	31.47%	30.65%
Tax expense/benefit/deferral	12.65%	31.47%	37.50%

Notes: This appendix presents frequency information for the top four general and account-specific issues cited in exempt firms' 404(a) opinions that disclose ineffective internal controls ($DisclosedIneffective_t=1$) from 2007 through 2014. For comparison purposes, frequencies for these issues are also presented for the non-exempt firms and all other accelerated filers from the AS2 regime (2004 through 2006). Issue classifications are determined by the Audit Analytics variables 'NOTEFF_ACC_REASON_KEYS' and 'NOTEFF_OTHER_REAS_KEYS.'

Appendix C

Subsample Descriptions and Variable Definitions

Subsample descriptions

Subsample	Definition
Exempt Firms	Firms not required to comply with 404(b). Defined as non-accelerated filers (firms with a public float of less than $75 million) that provide a 404(a) opinion with at least $5 million in assets and market capitalization that are exchange-traded and do not voluntarily comply with 404(b).
Non-Exempt Firms	Firms required to comply with Section 404(b) with a market capitalization of $300 million or less.
All Other Accelerated Filers	Firms required to comply with Section 404(b) with a market capitalization of more than $300 million.

Internal control effectiveness determinants variables

Variable	Definition
Age_t	Firm age. Defined as the natural log of the number of years a firm has been listed on Compustat as of year *t*.
$AggLoss_{t-1,t}$	Aggregate loss variable. Defined as =1 if a firm incurs an aggregate loss across years *t*−1 and *t* (($IB_t + IB_{t-1}$) < 0), and =0 if (($IB_t + IB_{t-1}$) > 0).
$BankInd_t$	Banking and financial services industry indicator. Defined as =1 if a firm is considered to be in industry 45 per the Fama and French (1997) 48-industry classification (SIC codes 6000, 6010–6036, 6040–6062, 6080–6082, 6090–6100, 6100–6113, 6120–6179, and 6190–6199) in year *t*, and =0 otherwise.
$Cash_{t-1}$	Cash and cash equivalents as a percentage of total assets (CHE ÷ AT) in year *t*−1.
$ComputerInd_t$	Computer software industry indicator. Defined as =1 if a firm is considered to be in industry 36 per the Fama and French (1997) 48-industry classification (SIC codes 7370–7373 and 7375) in year *t*, and =0 otherwise.
$DisclosedIneffective_t$	Disclosure of ineffective internal controls indicator. Defined as =1 if internal controls over financial reporting are disclosed as ineffective (IC_IS_EFFECTIVE ='N') and =0 if internal controls over financial reporting are deemed effective (IC_IS_EFFECTIVE='Y'). We require the internal controls opinion to be provided by a firm's external auditor for accelerated filers (IC_OP_TYPE='a') and by a firm's management for non-accelerated filers (IC_OP_TYPE='m'). Source: Audit Analytics' Section 404 Internal Controls database.
$ExtrInvGrowth_{t-2,t}$	Extreme inventory growth indicator. Defined as =1 if the percentage change in inventory from *t*−2 to *t* (($INVT_t$–$INVT_{t-2}$) ÷ $INVT_{t-2}$) is in the top quintile in year *t*, and =0 otherwise.
$ExtrSalesGrowth_{t-2,\ t}$	Extreme sales growth indicator. Defined as =1 if the percentage change in sales from *t*−2 to *t* (($SALE_t$–$SALE_{t-2}$) ÷ $SALE_{t-2}$) is in the top quintile in year *t*, and =0 otherwise.
$Foreign_{t-1,t}$	Foreign operations indicator. Defined as =1 if pre-tax foreign income (PIFO) is non-zero and non-missing in years *t*−1 or *t*, and =0 otherwise.
$Governance_{t-1}$	Governance measure. Decile rank of Accounting and Governance Risk (AGR) values as measured in the fourth quarter in year *t*−1. Source: GMI Ratings (www.msci.com)
$InstOwn_{t-1}$	Institutional investor ownership. Defined as the mean percentage of outstanding shares held by institutional investors (SHARES summed by CUSIP RDATE and divided by SHROUT1 × 1000) as of the most recent calendar quarter preceding the end of year *t*−1. Missing values are set =0. Source: Thomson Reuters Institutional (13 f) Holdings s34 Master File database.
$LitigiousInd_t$	Litigious industry indicator. Defined as =1 if a firm's SIC code is 2833–2836, 3570–3577, 3600–3674, 5200–5961, or 7370 in year *t*, and =0 otherwise.
$MaintainedIneffective_t$	Maintenance of ineffective internal controls indicator. Defined as =1 if a firm (1) discloses ineffective internal controls over financial reporting ($DisclosedIneffective_t$ =1), (2) discloses effective internal controls in its Form 10-K and subsequently re-states its financial statements due to ineffective internal control issues from Rice et al. (2015), or (3) files an amended 404 (b) opinion disclosing ineffective internal controls; and =0 otherwise. Source: (1) and (3) from Audit Analytics' Section 404 Internal Controls database and (2) from data provided by Sarah Rice, Dave Weber, and Biyu Wu.
$M\&A_{t-1,t}$	Mergers/acquisitions indicator. Defined as =1 if acquisitions (AQC), acquisitions' income contribution (AQI), or acquisitions' sales contribution (AQS) is non-missing and non-zero in years *t*–1 or *t*, and =0 otherwise.
$Prior404302_t$	Prior internal controls effectiveness indicator. Defined as =1 if a firm's 404(a) opinion in year *t*–1 or 302 reports in the first three quarters of year *t*−1 indicate ineffective internal controls, and =0 if the reports indicate effective internal controls.
$Restate_{t-2,t-1}$	Restatements indicator. Defined as =1 if a firm restates its year *t*–2 or *t*–1 financial statements, and =0 otherwise. Source: Audit Analytics' Non-Reliance Restatements database.
$Restructure_{t-1,t}$	Material restructuring indicator. Defined as =1 if the sum of pre-tax restructuring costs (RCP) as a percentage of total assets (AT) years *t*−1 and *t* is greater than 2 percent, and =0 otherwise.
Seg_t	Number of business and geographical segments a firm discloses in its Form 10-K. Defined as a count of unique SID by firm-year in year *t*. If segment disclosures are missing, then *Seg* =1. Source: Compustat Segments database.
$Size_{t-1}$	Natural log of market capitalization (PRCC_F × CSHO) in year *t*–1.

Variables used to identify internal control disclosure accuracy (exempt firms only)

Variable	Definition
$CrediblyEffective_t$	Credible disclosure of effective internal controls indicator. Defined as =1 if $DisclosedIneffective_t$ =0 and $PredictedProbability_t < 0.217$ (e.g., in the $PredictedProbability_t$ bottom four quintiles), and=0 otherwise.
$PredictedProbability_t$	Expected likelihood a firm maintains ineffective internal controls in year t. Defined as equal to $e^{(PredictedValue)} \div (1 + e^{(PredictedValue)})$. Values are bound between 0 and 1, with larger values indicating a greater likelihood.
$PredictedValue_t$	Ineffective internal control prediction score estimated from Eq. (2)
$SuspectedIneffective_t$	Suspected internal control misreporting of effective internal controls indicator. Defined as =1 if $DisclosedIneffective_t$=0 and $PredictedProbability_t \geq 0.217$ (e.g., in the $PredictedProbability_t$ top quintile), and =0 otherwise.
$SwitchToAF_{t+1}$	Switch to non-exempt status indicator. Defined as =1 if an observation is subject to 404(b) in year $t+1$ and was exempt from 404(b) in year t, and =0 otherwise.

Identification, disclosure, incentives, and ex-post realizations variables (exempt firms only)

Variable	Definition
$AbRet_{t+i \text{ through } t+k}$	Buy-and-hold size-decile-adjusted return in years $t+i$ through $t+k$.
$Amend404(a)_t$	Section 404(a) amendment to reflect ineffective internal controls indicator. Defined as =1 for firm-years where management disclosed effective internal controls in Form 10-K but ineffective internal controls in Form 10-K/A relating to year t, and =0 otherwise. Source: Audit Analytics' Section 404 Internal Controls database and hand-collected restatements data from Rice and Weber (2012) and Rice et al. (2015).
$Big4_t$	"Big 4" auditor indicator. Defined as =1 if 'AU' is equal to 4, 5, 6, or 7 (e.g., Ernst & Young, Deloitte, KPMG, and PwC, respectively), and =0 otherwise.
$DebtEquityIssuance_t$	External debt or equity financing indicator variable. Defined as =1 if the sum of the firm's issuance of long-term debt (DLTIS) and common or preferred stock (SSTK) is at least one percent of total assets (AT) in year t, and =0 otherwise. Missing values of DLTIS and SSTK are reset to zero.
$DelistPerformance$	Stock delisting due to poor firm performance indicator variable. Defined as =1 if a firm delists its stock due to poor firm performance (500 ≤ DLSTCD < 600) by December 31, 2015, and =0 otherwise. Source: CRSP.
$HighMA_{t-1,t}$	High managerial ability indicator. Defined as =1 if a firm's managerial ability score from Demerjian et al. (2012) is in the top decile of industry-year ranked scores in years t and t–1, and =0 otherwise. Source: http://faculty.washington.edu/smcvay/abilitydata.html
$Loss_t$	Loss indicator variable. Defined as =1 if income before extraordinary items (IB_t) < 0, and =0 if income before extraordinary items is greater than or equal to zero.
$NoRemediate_{t+1}$	Failure to remediate internal control weakness(es) indicator. Defined as =1 if $DisclosedIneffective_t$=1 and $DisclosedIneffective_{t+1}$=1, and =0 otherwise.
$Remediate_{t+1}$	Remediation of internal control weakness(es) indicator. Defined as =1 if $DisclosedIneffective_t$=1 and $DisclosedIneffective_{t+1}$=0, and =0 otherwise.
$Restate_t$	Restatements indicator. Defined as =1 if a firm restates its annual financial statements (RES_BEGIN_DATE <=DATADATE <=RES_END_DATE) originally filed in year t, and =0 otherwise. Source: Audit Analytics' Non-Reliance Restatements database.
ROA_{t+i}	Return on assets (ROA) in year $t+i$. ROA is defined as net income before extraordinary items (IB_t) ÷ average total assets ((AT_t +AT_{t-1})÷2).
$SalesGrowth_{t-2 \text{ to } t}$	Sales growth. Percentage change in sales from $t-2$ to t (($SALE_t$–$SALE_{t-2}$) ÷ $SALE_{t-2}$).
$Size_t$	Natural log of market capitalization (PRCC_F × CSHO) in year t.
$Zscore_t$	Altman Z-score calculated as 1.20 × ((ACT–LCT)/AT)+1.40 × (RE/AT)+3.30 × ((NI+XINT+TXT)/AT)+0.60 × ((CSHO × PRCC_F)/LT)+0.999 × (SALE/AT).
ΔAud_t	Auditor change variable. Defined as =1 if Audit Analytics' 'AUDITOR_CHANGED'=1 (a variable that indicates the departed auditor resigned or was dismissed from the audit engagement) and the auditor resignation date (DISMISS_DATE) occurs from the beginning of year t through the financial statement filing date of year t, and =0 otherwise. Source: Audit Analytics' Auditor Changes database.
$\Delta ROA_{t,t+3}$	Change in ROA from t to $t+3$ (ROA_{t+3}–ROA_t). ROA is defined as net income before extraordinary items (IB_t)÷average total assets ((AT_t+AT_{t-1})÷2).

Notes: All variables are from Compustat unless otherwise specified.

Appendix D

Predictions related to managers' ability to discover and incentives to disclose weaknesses

We examine how internal control effectiveness disclosure accuracy varies cross-sectionally with managers' ability to discover and incentives to disclose weaknesses. Drawing on the literature, we posit several measures, which we discuss below.

Ashbaugh-Skaife et al. (2007) provide a conceptual model of the existence, discovery, and disclosure of internal control deficiencies (their Fig. 1). We expect that managers with higher ability are better able to discover internal control issues absent the additional auditor oversight of 404(b), relative to their lower ability peers. We operationalize ability using a modification of the managerial ability measure constructed in Demerjian et al. (2012). By construction, managerial ability is orthogonal to firm performance. Prior research finds that this measure is associated with higher quality financial reporting

(Demerjian et al., 2013) and more ex-post accurate internal control disclosures (Chen et al., 2015). Following Chen et al. (2015), $HighMA_{t\text{-}1,t}$ is an indicator variable set equal to one when a manager's ability score is in the top decile by Fama and French (1997) industry in years t–1 and t, and zero otherwise.

We also consider whether the firm is audited by a Big 4 auditor ($Big4_t$) and whether the firm experienced an auditor change (ΔAud_t) in year t. Both of these variables have been shown to be associated with internal control weaknesses but relate more to discovery and disclosure than to the underlying existence of an issue (e.g., Ashbaugh-Skaife et al., 2007). We expect that suspected IC misreporters are less likely to have a Big 4 auditor than firms that disclose ineffective internal controls. In addition, to the extent that new auditors more carefully scrutinize a client's internal control disclosures, we expect suspected IC misreporters to be less likely to experience an auditor change in year t relative to firms that disclose ineffective internal controls.

Finally, we consider two incentive variables for IC misreporting. The first is a capital market-based incentive: new debt and equity issuances of at least 1 percent of assets in year t ($DebtEquityIssuance_t = 1$). Costello and Wittenberg-Moerman (2011) document that lenders increase interest rates and change debt contract design when a firm discloses ineffective internal controls, and Hammersley et al. (2008) document negative equity market consequences of disclosing ineffective internal controls. To the extent that managers perceive disclosing ineffective internal controls to have negative capital market consequences, we expect firms that maintain ineffective internal controls and issue new capital to have greater incentives to misreport. Our second incentive variable is the Altman Z-score, which measures the likelihood of bankruptcy. We expect that firms with a higher likelihood of bankruptcy are more likely to misreport because they have fewer resources for improving internal controls. Even if they recognize the importance of internal controls for the firm, they lack resources and have incentives to avoid disclosures of ineffective internal controls, that might further increase the likelihood of bankruptcy (e.g., by raising concerns by debtholders).

References

Alexander, C., Bauguess, S., Bernile, G., Lee, Y.H., Marietta-Westberg, J., 2013. Economic effects of SOX Section 404 compliance: a corporate insider perspective. J. Account. Econ. 56, 267–290.

Ashbaugh-Skaife, H., Collins, D., Kinney, W., 2007. The discovery and reporting of internal control deficiencies prior to SOX-mandated audits. J. Account. Econ. 44, 166–192.

Ashbaugh-Skaife, H., Collins, D., Kinney, W., LaFond, R., 2009. The effect of SOX internal control deficiencies on firm risk and cost of equity. J. Account. Res. 47 (1), 1–43.

Bedard, J., Graham, L., 2011. Factors associated with severity classification of Sarbanes-Oxley Section 404 internal control deficiencies. Account. Rev. 86 (3), 825–855.

Bedard, J., Hoitash, R., Hoitash, U., 2009. Evidence from the United States on the effect of auditor involvement in assessing internal control over financial reporting. Int. J. Audit. 13, 105–125.

Brown, L., Call, A., Clement, M., Sharp, N., 2015. Inside the "black box" of sell-side financial analysts. J. Account. Res. 53 (1), 1–47.

Brown, L., Call, A., Clement, M., Sharp, N., 2016. The activities of buy-side analysts and the determinants of their stock recommendations. Working paper, Temple University, Arizona State University, University of Texas at Austin, and Texas A&M University.

Chartered Financial Analyst Institute (CFA), 2011. Letter to the House Financial Services Committee. ⟨http://www.aicpa.org/Advocacy/Issues/DownloadableDocuments/404b/CAQ-CII-CFA_404_letter_92011.pdf⟩ (last accessed 18.02.14).

Chen, S., Lai, S., Liu, C., McVay, S., 2015. Managerial characteristics and internal controls. Working paper, National Taiwan University, Kainan University, Xiamen University, and University of Washington.

Cheng, M., Dhaliwal, D., Zhang, Y., 2013. Does investment efficiency improve after the disclosure of material weaknesses in internal control over financial reporting? J. Account. Econ. 56 (1), 1–18.

Coates IV, J.C., 2007. The goals and promise of the Sarbanes-Oxley Act. J. Econ. Perspect. 21, 91–116.

Coates IV, J.C., Srinivasan, S., 2014. SOX after ten years: a multidisciplinary review. Account. Horiz. 28 (3), 627–671.

Costello, A., Wittenberg-Moerman, R., 2011. The impact of financial reporting quality on debt contracting: evidence from internal control weakness reports. J. Account. Res. 49, 97–136.

Dechow, P., Ge, W., Larson, C., Sloan, R., 2011. Predicting material accounting misstatements. Contemp. Account. Res. 28 (1), 17–82.

DeFond, M., Lennox, C., 2017. Do PCAOB inspections improve the quality of internal control audits? J. Account. Res. (forthcoming).

Demerjian, P., Lev, B., Lewis, M., McVay, S., 2013. Managerial ability and earnings quality. Account. Rev. 88, 463–498.

Demerjian, P., Lev, B., McVay, S., 2012. Quantifying managerial ability: a new measure and validity tests. Manag. Sci. 58 (7), 1229–1248.

Doyle, J., Ge, W., McVay, S., 2007a. Accruals quality and internal control over financial reporting. Account. Rev. 82, 1141–1170.

Doyle, J., Ge, W., McVay, S., 2007b. Determinants of weaknesses in internal control over financial reporting. J. Account. Econ. 44, 193–223.

Erickson, M., Hanlon, M., Maydew, E., 2004. How much will firms pay for earnings that do not exist? Evidence of taxes paid on allegedly fraudulent earnings. Account. Rev. 79 (2), 387–408.

Fama, E., French, K., 1997. Industry cost of equity. J. Financ. Econ. 43 (2), 153–193.

Feng, M., Li, C., McVay, S., 2009. Internal control and management guidance. J. Account. Econ. 48 (2–3), 190–209.

Feng, M., Li, C., McVay, S., Skaife, H., 2015. Does ineffective internal control over financial reporting affect a firm's operations? Evidence from firms' inventory management. Account. Rev. 90, 529–557.

Filzen, J., Peterson, K., 2015. Financial statement complexity and meeting analysts' expectations. Contemp. Account. Res. 32 (4), 1560–1594.

Gao, F., Wu, J., Zimmerman, J., 2009. Unintended consequences of granting small firms exemptions from securities regulation: evidence from the Sarbanes-Oxley Act. J. Account. Res. 47 (2), 459–506.

Ge, W., McVay, S., 2005. The disclosure of material weaknesses in internal control after the Sarbanes-Oxley Act. Account. Horiz. 19 (3), 137–158.

Graham, J., Harvey, C., 2010. The equity risk premium in 2010 (Working paper). Duke University (Working paper) ⟨(https://ssrn.com/abstract=1654026)⟩.

Hammersley, J., Myers, L., Shakespeare, C., 2008. Market reaction to the disclosure of internal control weaknesses and to the characteristics of those weaknesses under Section 302 of the Sarbanes Oxley Act of 2002. Rev. Account. Stud. 13 (1), 141–165.

Hochberg, Y., Sapienza, P., Vissing-Jorgensen, A., 2009. A lobbying approach to evaluating the Sarbanes-Oxley Act of 2002. J. Account. Res. 47 (2), 519–583.

Holder, A., Karim, K.E., Robin, A., 2013. Was Dodd-Frank justified in exempting small firms from Section 404b compliance? Account. Horiz. 27, 1–22.

Hosmer, D., Lemeshow, S., 2000. In: Applied Logistic Regression2nd ed. John Wiley & Sons.

Iliev, P., 2010. The effect of SOX Section 404: costs, earnings quality, and stock prices. J. Financ. 65 (3), 1163–1196.

Jiang, J., Petroni, K., Wang, I., 2016. Private intermediary innovation and market liquidity: evidence from the Pink Sheets market. Contemp. Account. Res. 33 (3), 920–948.
Kinney, W., Martin, R., Shepardson, M., 2013. Reflections on a decade of SOX 404(b) audit production and alternatives. Account. Horiz. 27 (4), 799–813.
Kinney, W., Shepardson, M., 2011. Do control effectiveness disclosures require SOX 404(b) internal control audits? A natural experiment with small U.S. public companies. J. Account. Res. 49 (2), 413–448.
Krishnan, J., Krishnan, J., Song, H., 2011. The effect of Auditing Standard No. 5 on audit fees. Audit.: A J. Pract. Theory 30 (4), 1–27.
Krishnan, G., Yu, W., 2012. Do small firms benefit from auditor attestation of internal control effectiveness? Audit.: A J. Pract. Theory 34, 115–137.
Lawless, J.F., Singhal, K., 1978. Efficient screening of non-normal regression models. Biometrics 34 (2), 318–327.
Leuz, C., Triantis, A., Wang, T., 2008. Why do firms go dark? Causes and economic consequences of voluntary SEC deregistrations. J. Account. Econ. 45, 181–208.
Leuz, C., Wysocki, P., 2016. The economics of disclosure and financial reporting regulation: evidence and suggestions for future research. J. Account. Res. 54 (2), 525–622.
Lu, H., Richardson, G., Salterio, S., 2011. Direct and indirect effects on internal control weaknesses on accrual quality: evidence from a unique Canadian regulatory setting. Contemp. Account. Res. 28 (2), 675–707.
Minnis, M., Shroff, N., 2017. Why regulate private firm financial reporting? Account. Bus. Res. (forthcoming).
Palmrose, Z.V., 2010. Balancing the costs and benefits of auditing and financial reporting regulation post-SOX, Part I: perspectives from the nexus at the SEC. Account. Horiz. 24 (2), 313–326.
Public Company Accounting Oversight Board. (PCAOB), 2007. Report on the PCAOB's 2004, 2005, and 2006 inspection of domestic triennially inspected firms. October 22. Washington D.C.
Public Company Accounting Oversight Board. (PCAOB), 2009. PCAOB Release No. 2009-006. Report on the first-year implementation of Auditing Standard No. 5, An audit of internal control over financial reporting that is integrated with an audit of financial statements. September 29. Washington D.C.
Public Company Accounting Oversight Board. (PCAOB), 2013. Staff Practice Alert No. 11. Considerations for audits of internal control over financial reporting. October 24. Washington D.C.
Public Company Accounting Oversight Board. (PCAOB), 2014. Effective audits of internal control in the current “perfect storm.” Orlando, FL (March 26). ⟨http://pcaobus.org/News/Speech/Pages/03262014_IIA.aspx⟩ (last accessed 04.05.16).
Public Company Accounting Oversight Board. (PCAOB), 2015. Current issues, trends, and open questions in audits of internal control over financial reporting. Chicago, IL (August 8). ⟨http://pcaobus.org/News/Speech/Pages/08102015_Franzel.aspx⟩ (last accessed 04.05.16).
Rice, S., Weber, D., 2012. How effective is internal control reporting under SOX 404? Determinants of the (non-)disclosure of existing material weaknesses. J. Account. Res. 50 (3), 811–843.
Rice, S., Weber, D., Wu, B., 2015. Does SOX 404 have teeth? Consequences of the failure to report existing internal control weaknesses. Account. Rev. 90 (3), 1169–1200.
Schroeder, J., Shepardson, M., 2016. Do SOX 404 control audits and management assessments improve overall internal control system quality? Account. Rev. 91 (5), 1513–1541.
Shroff, N., 2017. Corporate investment and changes in GAAP. Rev. Account. Stud. (forthcoming).
Securities and Exchange Commission (SEC), 2002. Certification of disclosure in companies' quarterly and annual reports. Release Nos. 33-8124, 34-46427. SEC, Washington, DC (August 29).
Securities and Exchange Commission (SEC), 2011. Study and recommendation of Section 404(b) of the Sarbanes-Oxley Act of 2002 for issuers with public float between $75 and $250 million. SEC, Washington, DC (April).
U.S. Congress, 2002. The Sarbanes-Oxley Act of 2002. Public Law No. 107-204. Washington, D.C.: Government Printing Office. July 30, 2002.
U.S. Congress, 2010. The Dodd-Frank Wall Street Reform and Consumer Protection Act. Washington, D.C.: Government Printing Office. July 21, 2010.
U.S. Congress, 2011. Small Company Job Growth and Regulatory Relief Act. Washington, D.C.: H.R. 3213.
U.S. Congress, 2012. The Jumpstart of Business Startups Act. Washington, D.C.: Government Printing Office. April 5, 2012.
U.S. Congress. 2016a. The Fostering Innovation Act. Washington, D.C.: H.R. 4139.
U.S. Congress. 2016b. The Financial CHOICE Act. Washington, D.C.
Zhao, Y., Bedard, J., Hoitash, R., 2015. When does SOX 404 benefit financial reporting quality? Working paper.