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THE EFFECT OF AUDITORS' ASSESSMENT OF INTERNAL CONTROL OVER FINANCIAL REPORTING ON AUDIT FEES, COST OF DEBT AND NET COMPLIANCE BENEFIT

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Hongmei Jia, Student

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Dr. Dan Stone, Director of Graduate Studies

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DISSERTATION

A dissertation submitted in partial fulfillment of the
requirements for the degree of Doctor of Philosophy in the
College of Business and Economics
at the University of Kentucky

By
Hongmei Jia

Lexington, Kentucky

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and Dr. Hong Xie, Associate Professor of Accountancy

Lexington, Kentucky

ABSTRACT OF DISSERTATION

THE EFFECT OF AUDITORS' ASSESSMENT OF INTERNAL CONTROL OVER FINANCIAL REPORTING ON AUDIT FEES, COST OF DEBT AND NET COMPLIANCE BENEFIT

In this study, I use Section 404(b) of the 2002 Sarbanes-Oxley Act as an exogenous shock to examine the effect of auditors' assessment of internal control over financial reporting (ICFR) on audit fees, cost of debt, and net value of compliance between 2002 and 2010. Using firms themselves as their own control, this study conducts firm-fixed effects analyses to explore the close causal effect of SOX 404(b) on compliance costs (proxied by audit fees), compliance benefit (proxied by cost of debt) and net compliance benefit (proxied by Tobin's *q*). Through analyzing how SOX 404(b) affects firms' compliance cost, compliance benefit, and net compliance benefit, the results suggest that SOX 404(b) decreases firms' cost of debt, but also imposes compliance costs. Overall, SOX 404(b) increases firm value premium by around 8.63%. The study also examines whether the 2007 reforms have achieved their purpose by comparing audit fees before and after the 2007 reforms.

KEYWORDS: Section 404(b); 2002 Sarbanes-Oxley Act; Auditors' assessment ICFR; Firm value premium; 2007 reforms

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07/25/2013

Date

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TABLE OF CONTENTS

TABLE OF CONTENTS (Continued)

LIST OF TABLES

LIST OF FIGURES

Chapter 1

Introduction

The Dodd-Frank Wall Street Reform and Consumer Protection Act (Dodd-Frank Act) took effect July 21, 2010, permanently exempting non-accelerated filers from Section 404(b) of the Sarbanes-Oxley Act of 2002.[1] Non-accelerated filers are issuers whose public float is under $75million. SOX 404(b) requires external auditors to assess internal control over the financial report (ICFR). Stakeholders need to find out: what are the effects of this exemption? From the implementation of the original provision to the exemption less than a decade later, SOX 404(b) has engendered controversy and debate. Ball (2009) observes that we are still not clear today about the value of the 1933-1934 Securities Acts, and we are certainly far from understanding the effects of Section 404(b). Thus, before we can evaluate the SOX 404(b) exemption, we need to answer a more fundamental question: what is the value of SOX 404(b)?

In this study, I use Section 404(b) of the 2002 Sarbanes-Oxley Act as an exogenous shock to examine the effect of auditors' assessment of internal control over financial reporting on audit fees, cost of debt, and net compliance benefit between 2002 and 2010. Following prior literature (Minton and Schrand 1999; Ahmed et al. 2002; Jiang 2008; Cassell et al. 2011), I use Standard & Poor's (S&P) long-term domestic issuer credit rating to estimate the cost of debt. Following Daske et al. (2008), I use Tobin's *q* to proxy net compliance benefit. The appendix in Daske et al. (2008)'s study provides a detailed discussion regarding the theoretical concept and measurement of Tobin's *q*.

Under Section 404 of management assessment of internal control of Sarbanes-Oxley Act, part (a) requires management to certify or disclose their assessment of internal control over financial reporting (ICFR) to investors. Part (b) requires auditors to attest and report on management's assessment. The Dodd-Frank Act went into effect in 2010, adding Section 404(c),

[1] In the following of this paper, I use SOX for Sarbanes-Oxley Act of 2002. I use SOX 404(b) for section 404 (b) of Sarbanes-Oxley Act of 2002.

which permanently exempts all non-accelerated filers from SOX 404(b).

The regulation change created different groups of firms which comply with SOX 404(a) and (b) on different schedules. "Large accelerated filers" include companies with a public float of $700 million or more. Reporting companies with a public float between $75 and $700 are defined as "accelerated filers". For U.S. issuers, large accelerated filers and accelerated filers are required to comply with SOX 404(a) and SOX 404(b) starting with the fiscal year ending on or after November 15, 2004. Non-accelerated filers—any firm below $75 million in public float—must comply with SOX 404(a) for fiscal year ending on or after December 15, 2007, and they are exempted from SOX 404(b) as a result of the Dodd-Frank Act.

Public float is the "aggregate market value of voting and non-voting common equity held by non-affiliates of the issuer" (SEC release 33-8644), and it is measured on the "last business day of the issuers' most recently completed second fiscal quarter" (SEC release 33-8644). Non-accelerated filers whose public float breaks the $75 million threshold automatically change their status and are required to comply with SOX 404(b) during that fiscal year. Accelerated filers can become non-accelerated when their public float falls below $50 million during that fiscal year (SEC release 33-8644).

After the passage of SOX 404(b) several years ago, the recent change brought by the SOX 404(c) exemption for non-accelerated filers makes for a unique study in financial regulation. Every entity involved in this regulation—including the regulators, investors, auditors and managers—has strong interest in evaluating the benefit and cost of Section 404(b). Regulators particularly are interested in finding out not only how SOX 404(b) affects accelerated filers, but also how SOX 404(b) *would* affect non-accelerated filers in the absence of an exemption. Not surprisingly, the most consistent conclusion we have gotten is that SOX 404(b) is costly, and the cost is disproportionally high for the small firms (CRA 2006; GAO 2006; Zhang 2007; Raghunandan and Rama 2006; Hogan and Wilkins 2008; Hoitash et al. 2008; SEC survey (SEC [2009a]); Iliev. 2010; Kinney and Shepardson 2011).

Concerned with high audit costs, regulators passed two reforms in 2007 aimed at reducing the compliance burden of SOX 404 by addressing ICFR assessments (SEC 2011). First, the SEC released guidance on management reporting on internal control over financial reporting on June 2007. Second, the PCAOB adopted Auditing Standard No.5 (AS5) on December 2007. Both the SEC guidance and AS5 proposed an approach of "top-down, risk-based evaluation of internal control over financial reporting" (SEC release No.33-8810; 34-55929). The SEC guidance addresses management's self-assessment, while AS5 focuses on the auditor's assessment. The 2007 reforms aim to decrease the compliance cost of SOX 404 by directing management and auditors to focus on high-risk accounts. The justification behind SOX 404(c) permanently exempting all non-accelerated filers from SOX 404(b) is the same as for the 2007 reform. However, controversy surrounds the idea of exempting small firms from so many regulations (Bradford 2004; Campbell 2006; Castelluccio 2005; Orcutt 2009; Anginer, Nararayan, Schipani and Seyhun forthcoming).

Using firms themselves as their own control, this study conducts firm-fixed effects analyses to explore the close causal effect of SOX 404(b) on compliance costs (proxied by audit fees), compliance benefit (proxied by cost of debt) and the net compliance benefit (proxied by Tobin's *q*). Through analyzing how SOX 404(b) affects firms' compliance cost, compliance benefit, and net compliance benefit, the results suggest that SOX 404(b) decreases firms' cost of debt, but also imposes compliance costs. Overall, SOX 404(b) brings firm net compliance benefit. The study also examines whether the 2007 reforms have achieved their purpose by comparing audit fees before and after the 2007 reforms.

This study is motivated by two concerns. First, many studies have conducted insightful research on the effects of internal control quality on the cost of debt; but there has not been direct evidence on the value of obtaining the auditor's assessment, independent of internal control quality. For example, prior studies have examined the relationship between ICFR quality and earnings quality (Bedard 2006; Doyle et al. 2007; Ashbaugh-Skaife et al. 2008) and the results

suggest that strong internal control systems provide higher earnings quality. Some studies provide evidence that an ineffective internal control system—meaning the existence of one or more material weakness—associates with a high cost of equity (Beneish et al. 2008; Ashbaugh-Skaife et al. 2009) and a high cost of private and public debt (Dhaliwal et al. 2011; Costello et al. 2011; Kim et al. 2011). One study links effective ICFR with accurate management forecast (Feng et al. 2009). Another study (Goh et al. 2011) provides evidence for an association between effective ICFR and conditional conservatism. A few studies associate both high quality of corporate government, as well as independent audit committees, with strong internal control systems (Krishnan2005; Zhang et al. 2007; Hoitash et al.2009; Goh 2009).

The sample under internal control quality research is limited to firms under auditor scrutiny, and they focus on the *outcome* of the auditor assessment of internal control. Non-accelerated filers make up 60% of all issuers, yet studies have only focused on accelerated filers. Indeed, all these studies provide useful evidence on how effective internal control systems will affect firms via different mechanisms. However, another fundamental question, which is not fully answered, is that, for *all* firms, what are the cost, benefit and net compliance benefit of SOX 404(b)? Particularly, how do investors value the auditors' attestation of ICFR? Regulators are particularly interested in this question because SOX 404 addresses only disclosures and attestations (and incurs costs while doing so), without issuing additional requirements for internal controls.

Some studies have examined the value of auditors' assessments in the role of uncovering ICFR deficiencies. Using a sample of propriety data, Bedard and Graham (2011) present evidence that auditors' attestations contain better information than management's disclosures. Specifically, their results indicate auditors detect more unremediated internal control deficiencies (ICDs) than management. They also find that auditors use a lower threshold to classify ICDs as a significant deficiency or material weakness. However, using a sample of firms whose market capitalization is under $300 million, Kinney and Shepardson (2011) find there is no statistical difference in the

increase in the disclosure rate of material weakness for accelerated filers which are subject to auditors' assessment, and non-accelerated filers which are not subject to auditors' involvement at their initial year of compliance respectively (2004 for accelerated filers and 2007 for non-accelerated filers).

Section 404(b) remains controversial, and research has not reached a firm conclusion. Regulators have shown notable interest in evaluating the regulation of SOX 404(b). Recently, according to Section 989I of the Dodd-Frank Act, the Government Accountability Office (GAO) must study "the cost of capital for issuers that are exempt from such section 404(b) compared to the cost of capital for issuers that are required to comply with such section 404(b) and whether there is any difference in the confidence of investors in the integrity of financial statements of issuers that comply with such section 404(b) and issuers that are exempt from compliance with such section 404(b)" (SEC 2011). Recently, a surge in restatements by non-accelerated filers just after their exemption from Section 404(b) has drawn all the related parties' attention and highlighted the debate over whether non-accelerated filers should be exempt (see Whitehouse, 2011).

This study seeks to investigate the value of SOX 404(b) over a relatively long time. This study examines a longer post-SOX 404(b) period than merely the initial implementation year. Section 404(b) aims to "[offer] significant long-term benefit in helping to prevent fraud and misdirection of corporate resources and in improving the accuracy of financial reporting "(SEC, 2005a). The SOX 2002 Act occurred in response to a series of high-profile corporate scandals. The Act frequently receives criticism because, given the circumstances and environment at the time, SOX may represent overregulation and encourage auditors to overreact. Section 404 is the most significant reform in financial reporting and corporation governance in eight decades (Donaldson, 2005; Li, Pincus, & Rego, 2008). However, Section 404(b) is probably the most controversial regulation as well. The main debate is whether the benefit of compliance outweighs its cost, especially for the small firms.

Proper analysis of compliance costs requires data taken over a long time period. According to an SEC-sponsored Web survey on investigating the implementation of Section 404 in 2009, "Some of [the compliance] costs are recurring fixed costs while others are one-time start-up costs borne in the first years of compliance that tend to dissipate over time". Setting up an internal control system requires an investment by a firm, and we cannot reach the conclusion that the cost is too high based only on the initial investment cost. Meanwhile, SOX 404(b) comes from a truly unusual regulation regime, and both regulators and auditors may have overreacted given the circumstances. All previous studies have analyzed the cost for firms beginning to comply with both SOX 404(a) and 404(b), but none has isolated 404(b) costs. Now that, non-accelerated filers have paid costs to comply with 404(a), it is possible to identify 404(b)-specific costs as companies move from non-accelerated to accelerated status.

Two studies (Altamuro and Beatty 2010; Krishnan and Yu 2012) have investigated the effect of auditors' assessment of ICFR while another two studies (Iliev2010; Singer and You 2011) examined the joint effect of both 404(a) and 404(b). This present study is quite different from any of the above four studies.

Krishnan and Yu (2012) examine the effect of SOX 404(b) on revenue quality. Using a sample of large non-accelerated firms and small accelerated firms, they find a positive association between revenue quality and auditor assessment of ICFR. In Altamuro and Beatty (2010)'s paper, they investigate the effect of the Federal Depository Insurance Corporation Improvement Act (FDICIA) of 1991 on the loan-loss provision validity, earnings persistence, cash-flow predictability, benchmark-beating, and accounting conservatism in the U.S. banking industry. Their results show that FDICIA has affected financial reporting in a positive way. FDICIA is similar to SOX 404(b), but only applies to the banking industry. The major difference between this study and Altamuro & Beatty's study lies within the broader scope—this study provides more generalizable results for all shareholders.

In Singer and You (2011)'s study, they compare American accelerated filers against

Canadian firms which list on a U.S. exchange in order to investigate the effect of Section 404 on earning qualities in the pre-404 period (2002-2003) and post-404 period (2004-2005). They use absolute abnormal accruals to proxy earnings reliability, and find "complying firms reduced the absolute magnitude of their abnormal accruals significantly more than the control firms" (Singer and You, p570). They also present weak evidence that complying firms experience a greater decrease in intentional misstatement than control firms after Section 404 took effect. They find that after Section 404, the earnings predictive ability increased more for the complying firms than for the noncompliance firms.

Using cross-sectional data in 2004, Iliev (2010) investigated the effect of SOX 404 on audit fees, financial reporting quality and firm market value at the initial year of implementation. He finds that SOX 404 improves earnings quality, evidenced by decreased abnormal accrual and increase audit fees. He also finds that SOX 404 decreases firm market value, measured using stock returns and event studies.

This study's substantial contribution lies in it being the first to capture a complete picture of how SOX 404 affects firms' audit cost, cost of debt, and net compliance benefit. At the initial three years of implementation of SOX 404, this study provides evidence that the implementation cost is unusually high, and the value of SOX 404 during this time period is unclear. After the 2007 reform, implementation costs have decreased; the cost of debt has decreased, and the net compliance benefit has increased. This finding is of particular interest to regulators, providing empirical evidence on how this regulation is affecting firms.

The second contribution is that this study examines the pure effect of SOX 404(b) by isolating this subsection from other regulations, and particularly from SOX 404(a). Using a sample of firms that have newly began or discontinued complying with SOX 404(b), the study examines firm-specific consequences of auditors' assessment of ICFR. The study provides clear evidence on the value of auditors' assessment of ICFR by identifying the changes at the firm level of audit fees, cost of debt and net compliance benefit due to the exogenous legal requirement.

This study examines the differences in both cost of capital and investors' confidence for accelerated and non-accelerated filers.

This study also adds to the broad literature regarding the value of auditor assurance services, providing evidence for the value of auditors' assessment of ICFR. From theory, Jensen and Meckling (1976) and Fama and Jensen (1983) demonstrate that agency problems arise when there is a separation of ownership and control. Management tends to maximize its own interests, which often do not align with shareholders' interests. Information asymmetry further exacerbates the agency problem because management always possesses better access to information than shareholders. One way to decrease information asymmetry is to strengthen monitoring mechanisms through a third party: auditors. Prior studies have documented the value of auditor assurance services in mitigating the effects of information asymmetry (Blackwell et al.1998). Using the legal shock as the basis, this study provides new evidence on the cost, benefit, and net compliance benefit of auditors' attestation ICFR.

Some limitations of this research: first, this study does not cover an exhaustive set of benefits from SOX 404(b) since other benefits exist beside a decreased cost of debt, such as an improvement in outsiders' confidence in the company. Second, this study is only concerned with the real effects of 404(b); not whether the regulation was the best way to achieve the goals of its drafters.

This study is organized as follows: Chapter 2 explains the history surrounding SOX 404; Extant literature, hypothesis development and research questions appear in Chapter3; Chapter 4 describes the data and empirical models; Chapter 5 outlines the sample selection procedure; Chapter 6 presents the data and primary results; Chapter 7 present an example and further analysis; Chapter 8 summarizes the results and concludes this study.

Chapter 2

Institution background

Since 1977, the Foreign Corrupt Practices Act (FCPA) has required *all* issuers--no matter how small they are--to maintain an internal control system. What SOX 404 required beyond FCPA is an increase in *disclosure* requirements for issuers (Palmrose 2010). Section 404(a) focused on management's disclosure regarding the outcome of the assessment of internal control over financing reporting. Strictly speaking, SOX 404(a) is not totally novel because firms are required to disclose the ICFR as part of their 8-K filings when there is a change in auditors. Section 404(b) requires auditors to assess and report on managements' assessment of ICFR. Thus, Section 404(b) is an entirely new regulation.

The U.S. Congress passed the Sarbanes-Oxley Act on July 25, 2002 in response to a series of high-profile financial scandals. The legislation was intended to restore investors' confidence in capital markets. Two separate sections under SOX—Section 302 and Section 404—are related to internal control over financial reporting. When it comes to financial reporting, these two Sections constitute the bulk of SOX's effect because they directly address the process of generating financial reporting. Under the title of "Corporate Responsibility for Financial Reports", Section 302 requires management to certify the internal control over financial reporting in its quarterly and annual filings. The title of Section 404 is "Management Assessment of Internal Control"**.** Section 404 originally included parts (a) and (b) when signed into law. Section 404(a) requires all the issuers submit annual internal control reports and shall

(1) State the responsibility of management for establishing and maintaining an adequate internal control structure and procedures for financial reporting; and
(2) Contain an assessment, as of the end of the most recent fiscal year of the issuer, of the effectiveness of the internal control structure and procedures of the issuer for financial reporting (SOX 404).

Meanwhile, in Section (b) under the title of "Internal Control Evaluation and Reporting", it states auditors "shall attest to, and report on, the assessment (of internal control over financial reporting) made by the management of the issuer".

The implementation of Section 404(b) for non-accelerated filers has been postponed several times and permanently halted with the exemption in the 2010 Dodd-Frank Act. The initial date for both accelerated filers and non-accelerated filers to comply with Section 404(a) and Section 404(b) was June 15, 2004 (SEC release 33-8238). Then, on Feb.24, 2004, the SEC extended the compliance date for accelerated filers to November 15, 2004. Meanwhile, the SEC extended the same requirement for non-accelerated filers to July 15, 2005 (SEC release 33-8392). While accelerated filers were held to the November 2004 deadline, the SEC gave another extension on March 2, 2005 for non-accelerated filers to comply with both sections on July 15, 2006 (SEC release 33-8545). The SEC repeatedly postponed the deadline. Since then, the SEC separated the requirement of compliance with Section (a) and Section (b) and gave several extra extensions for non-accelerated filers to comply with the two Sections. On Sep.22, 2005, the SEC extended the compliance dates for the non-accelerated filers to comply Section 404 (a) to July 15, 2006 (SEC release 33-8168). Another extension was grounded on Dec15, 2006. Once again, the SEC extended the compliance date for the non-accelerated filers to comply with Section 404 (a) from July 15, 2006 to December 15, 2007 (SEC release 33-8760). Meanwhile, the SEC mentioned that the date should be postponed again. For the first time, the SEC states the date for the non-accelerated filers to comply with Section 404 (b) is December 15, 2008. On Jun. 26, 2008, the SEC release the amendments to its prior release and made the date of December 15, 2009 to be the compliance date of Section 404 (b) for the non-accelerated filers (SEC Release 33-8934). On Oct 13, 2009, the SEC further postponed the compliance date of Section 404 (b) for non-accelerated filers to June 15, 2010 (SEC release 33-9072). Finally, on Sep 15, 2010, the SEC adopted Section 404(c) as a result of Section 989G of the Dodd-Frank Act. Section 404(c) exempts non-accelerated filers from Section 404(b), meaning that non-accelerated filers shall not provide an auditor assessment of internal control over financial reporting in their annual report. In a summary, the compliance date of Section 404(a) and Section 404(b) for the accelerated filers is November 15, 2004. The compliance date of Section 404(a) for the non-accelerated filers is

December 15, 2007.

Figure 1 outlines the timeline of regulatory events. I divided the whole period into two major parts—before 2007 reform and after 2007 reform. Before 2007 reform period includes two events. Fiscal year ending on or after November 15 2004, SOX 404(a) and SOX 404(b) implemented for accelerated filers. Fiscal year ending on or after December 15 2007, SOX 404(a) implemented for non-accelerated filers. After 2007 reform, Dodd-Frank Act permanently exempts non-accelerated filers from SOX 404(b) on July 21 2010.

Figure 1

Timeline of Regulatory Events[a]

Before 2007 Reform			After 2007 Reform
11/25/2004	12/15/2007	2007 reform	7/21/2010
SOX 404(a) and SOX(b) implemented for accelerated filers	SOX 404(a) implemented for non-accelerated filers	1. PCAOB replaced AS2 with AS5. Focus on risk; expected to reduce audit fees 2. SEC management guidance for SOX 404(a)	Dodd-Frank Act. Permanently exempts non-accelerated filers from SOX 404(b)

[a]The dates refer to the fiscal year ending on or after that date

Chapter 3

Extant literature and hypothesis

Regulators have repeatedly postponed the compliance dates for both accelerated and non-accelerated filers. Concerns over compliance costs–particularly for non-accelerated filers–were the primary motivation for each extension. Current research reviews controversial behaviors regarding how non-accelerated filers respond to SOX 404(b). Engel, Hayes, and Wang (2007) and Leuz, Triantis, and Wang (2008) provide evidence that some firms go dark or private to avoid compliance. Moreover, some studies (Gao et al. 2009; Iliev 2010; Nondorf et al. 2012) indicate that non-accelerated filers near the public float threshold of $75 million might manipulate their public float to retain their non-accelerated status. On the other hand, Cassell, Myers and Zhou (2011) document some non-accelerated filers voluntarily adopting SOX 404(b), enjoying a lower cost of capital. This study seeks to explore the net compliance benefit of SOX 404(b) by evaluating its benefits and costs.

3.1. Compliance Cost

The debate over compliance with Section 404(b) focuses on its costs. However, no academic study has documented the specific impact of Section 404(b) on firms' audit fees. Current studies examine the simultaneous effect of Sections 404(a) and 404(b) on audit fees. Both regulators and academics document skyrocketing implementation costs associated with Section 404 during the initial years of implementation (Raghunandan and Rama 2006; Hogan and Wilkins 2008; Hoitash et al. 2008; SEC survey(SEC[2009a]); Iliev. 2010; Kinney and Shepardson 2011). According to Iliev (2010)'s results, total audit fees increased by 86.6% in the first year of compliance. According to an SEC web-based survey, the mean of Section 404(b)'s total compliance cost—which includes internal labor cost, audit fees related to ICFR, outside vendor fees and non-labor cost—is $2.87 million before 2007 and $2.33 million afterwards. Both numbers are higher than the SEC staff's initial estimate.

Some studies have examined the effect of AS5 on audit fees (Doogar et al. 2010;

Krishnan et al. 2011).[2] Using a sample of accelerated filers with clean ICFR opinions that have experienced both regulation AS2 and regulation AS5, Doogar, Sivadasan, and Solomon (2010) find that AS5 addresses audit fraud risk better than AS2, meanwhile, AS5 leads to lower audit fees compared with AS2.[3] Krishnan et al. (2011) extend these findings to firms with qualified ICFR opinions. Their results suggest that firms' audit fees are lower in the first two years of AS5 period than that in the last two years of AS2 period for firms which remediate their internal control weaknesses and for firms which receive their first adverse internal control opinion. However, their findings do not show that small firms benefit from AS5.

Collectively, prior studies have provided evidence regarding how SOX 404 affects audit fees for accelerated filers at the initial year of compliance. Two concerns exist regarding the current evidence. First, no clear empirical evidence demonstrates the link between SOX 404(b) and audit fees. Second, the initial implementation year does not provide an efficient estimate of compliance costs for SOX404. Therefore, my hypothesis focuses on audit fees:

H1: *Audit fees increase (decrease) for companies that switch from required noncompliance (compliance) to compliance (noncompliance) with SOX 404(b).*

3.2. Cost of Debt

Jensen and Meckling (1976) and Fama and Jensen (1983) illustrate how separation between ownership and control raises agency problems previously discussed also construct a barrier to the flow of capital. Shareholders largely rely on information disclosed by management. The agency and information asymmetry problems affect shareholders' willingness to provide capital. Shareholders expend considerable effort gathering information in order to reduce information asymmetry. Meanwhile, shareholders need to monitor management to decrease the agency problem. Information-gathering and monitoring management can be extraordinarily costly and sometimes infeasible. On the other hand, investors will adjust for these problems when they

[2] AS5 refers Auditing Standard NO.5.
[3] AS2 refers Auditing Standard NO.2.

provide capital and so request a higher return on capital to offset the risks.

Prior studies (Jensen and Meckling 1976; Ng and Stoeckenius 1979; Evans 1980; Gjesdal 1981; Antle 1982, 1984; Datar 1985; Baiman, Evans, and Noel 1987) have modeled the role of auditing as a mechanistic monitor. As Jensen and Meckling hypothesize: audit, one type of monitoring activity, should mitigate the information asymmetry problem. From theory, cost of capital is negatively associated with auditors' monitoring.

Current studies have documented the positive relationship between cost of capital and information risk (Leftwich 1983; Easley and O'Hara 2004; Yu 2005; Hribar and Jenkins 2004; Francis et al. 2004; Lambert et al. 2007; Kravet and Shevlin 2010; Chen et al. 2010; Lambert et al. 2011). Particularly, in the theoretical framework of Lambert et al. (2007), the authors demonstrate why the quality of accounting information affects the cost of capital. Accounting information quality affects firms' cost of capital because when market participants make an assessment of the future cash flow distribution, the variance of firm *m*'s cash flow and the covariance of firm *m*'s cash flow with the cash flow from all the other firms in the market is positively related to accounting information noise and measurement error. The expected return decreases as the accounting information noise increases.

Meanwhile, extant research suggests that auditors' assessment of ICFR and management's self-assessment of ICFR improve financial reporting quality (Altamuro and Beatty 2010; Singer and You 2011). Altamuro and Beatty (2010) find a positive relationship between internal control regulation and the quality of financial reporting. Using a control sample of Canadian companies which are either cross-listed or only listed on U.S. exchanges, Singer and You (2011) find the quality of financial reporting has improved for all complying SOX 404 accelerated filers compared with the control noncompliance sample.

Using a sample of propriety data from several large audit firms, Bedard and Graham (2011) document the value of auditors' assessment of ICFR, providing evidence that not only auditors do identify about three-fourths of unremediated internal control deficiencies (ICD), but

they also set lower thresholds –in other words, they set higher standards for classifying the severity of ICD than management does. Their results demonstrate a marginal increase in financial reporting quality when auditors provide an assessment of ICFR along with management, compared to only management providing one.

Cassell, Myers, and Zhou (2011) present evidence that companies which voluntary adopt SOX 404(b) enjoy lower cost of equity and cost of debt. They measure cost of debt using Standard & Poor's (S&P) long-term domestic issuer credit rating. Using a sample of privately held companies in the United Kingdom, Lennox and Pittman (2011) document that companies which voluntary adopt audit assurance services upgrade their credit rating by sending positive signals. With the evidence we have currently available, it is impossible to distinguish the value of auditor attestation from the effect of positive signals for the voluntary-adopting SOX 404(b) companies.

Collectively, Lambert et al. (2007)'s analytical framework theorizes that high information quality should decrease the cost of capital. Theory and empirical evidence (Bedard and Graham 2011) suggest the monitoring role of auditors enables them to provide higher information quality. For two reasons, I predict the cost of debt will increase for companies that switch from compliance with SOX 404(b) to noncompliance. First, companies lose any benefit from auditors' attestation value when they cease complying. Second, the market will interpret a negative signal when companies discontinue their compliance. These reasons lead to the following hypotheses:

> ***H2:*** *Credit rating improves (deteriorates) for companies that switch from required noncompliance (compliance) to compliance (noncompliance) with SOX 404(b).*

3.3 Net Compliance Benefit

SOX 404 has proven one of the most significant portions of the 2002 SOX Act; and also the most controversial. Not surprisingly, extant studies document different firm behaviors toward this regulation. Using a sample of firms whose public float are near the threshold at the first year of compliance in 2004, Iliev (2010) employs a cross-sectional regression discontinuity design to

study how SOX 404 affects the market value. He uses an event study, and two-year returns to exploit the net valuation of SOX 404. In the event study, he lists ten events from the announcement of the compliance date of SOX 404 in August 2002 to the final date of May 17, 2005, when the *New York Times* published on article reporting on the SEC's desire to trim SOX 404 costs. While results were somewhat mixed, the majority indicated that the market responds negatively toward SOX 404 enforcement. In the two-year (2003-2005) returns study, he constructs an equal-weighted long-short portfolio. The portfolio takes a long position on all firms required to comply with SOX 404 in 2002, and it shorts all noncompliance firms. The portfolio has a negative monthly risk-adjusted return of -0.81% per month. Taken together, studies indicate that SOX 404 decreases small firms' market value. However, the results in Iliev's study should be interpreted with caution because his test period is so restricted. At the initial year of implementation, the negative perception of SOX 404 could reflect a transitional value effect instead of the real effect.

In this cost-benefit analysis, I use audit fees and credit rating to proxy the cost and benefit of the effect of SOX 404(b), respectively. In the final step, I would like to evaluate the net impact of SOX 404(b) after taking consideration of both benefit and cost. In a perfect world, if I could calculate the dollar amounts for both the overall costs and benefits, it would be easy to obtain the net effect by subtracting the costs from the benefit. However, it is not feasible in reality because not all of the costs and benefits data are public available, and some of them are difficult to measure. I need to find a variable to proxy for net compliance benefit. Tobin's q is a suitable candidate to proxy net compliance benefit because it consists of market valuation and reproduction cost. Tobin's q reflects market value premium. Brainard and Tobin (1968) first introduce the concept of Tobin's q in a static equilibrium financial system model and the name of Tobin's q does not appear until the article "A general equilibrium approach to monetary theory" (Tobin 1969). Brainard and Tobin (1968) provide the definition of Tobin's q as the ratio of market valuation of equities to the replacement cost of the physical assets they represent (p103).

In theory, a difference in Tobin's *q* reflects various market valuations. Tobin and Brainard (1977) also provide the rationale behind the theory. In a market, for the same goods, when the value of the existing goods exceeds the current cost of producing the identical ones, the value of newly produced goods will rise, and it will encourage investment (under the incentive) to gain the difference between the market price and reproduced cost. When the ratio is greater than 1, it will increase a firm's market valuation after making new investment because the assets are worth more in the market than their costs to produce them. On the contrary, when the Tobin's q is less than 1, it discourages new investment.

A high Tobin's *q* suggests a larger firm value premium because investors assign valuable intangible assets in addition to physical assets, such as monopoly power (Lindenberg and Ross 1981), good will, or sound governance. From the equity valuation model, "Higher values of Tobin's *q* could reflect differences in expected discount rates and/or differences in expected future cash flows" (Daske et al. 2008). Tobin's *q* "has been the workhorse of large-sample valuation studies" (Gompers et al. 2010). Many corporate finance papers use Tobin's *q* to proxy firm equity valuation (e.g. Servaes 1991, Lang and Stulz 1994, Daske et al. 2008, Chemmanur et al. 2009, Black and Kim 2011). I have not found many accounting studies that have used Tobin's *q*. However, one example I have found is the study done by Daske et al. (2008). In the study, they use Tobin's *q* to proxy firm's value to investigate the economic effects of mandatory adoption of International Financial Reporting Standards (IFRS) around the world. In my study, high Tobin's *q* suggests high net compliance benefit because investors assign more valuable intangible assets to those firms.

Theoretical arguments predict the relationship between auditors' assessment of ICFR and market valuation of the firm's asset is that the auditor's assessment of ICFR will increase the firm's value premium. The rationale behind it is that the auditor assessment should decrease information asymmetry between the management and investors, and investors should be more confident with the information provided by the management. Investors will assign a high value

premium for firms that have their ICFR audited.

Intuition suggests that the policymakers who voted in favor of the SOX legislation believed the issue would carry a net social benefit. Economic theory also provides arguments for why firm value premium in particular might also improve as a result of SOX 404(b) legislation. From theory, SOX 404(b) should reduce information asymmetry between management and investors, leading investors to reduce discounts imposed on their valuations. This should also lead investors to reduce discounts they impose on their valuations as a result of perceived information risk. Thus, I make the following hypothesis:

> ***H3**: Firm net compliance benefits increases (decreases) for companies that switch from required noncompliance (compliance) to compliance (noncompliance) with SOX 404(b).*

Chapter 4

Research design, model specification, and data

4.1 Research Design

To conduct the panel-year regression empirical tests, I identify the key variable of interest based on data from Audit Analytics, and divide the sample into two groups depending on firms' SOX 404(b) compliance status: accelerated filer and non-accelerated filer. The key variable *sox404b* represents the compliance status for each firm. Specifically, *sox404b* = 1 when firms are required to comply with SOX 404(b), and *sox404b* =0 when firms are not. Because all accelerated filers required compliance with SOX 404 for the fiscal year ending on or after November 15, 2004, I set all firms as noncompliance status before the compliance date. According to the regulation, a firm's filing status is measured as the firm's public float on the last business day of the second fiscal quarter. If a firm qualifies for this criterion at the second fiscal quarter, then the firm needs to change its filing status from the non-accelerated filer to accelerated filer in the annual 10-K filing. The critical change is that as an accelerated filer, the firm needs to comply with SOX 404(b) during the same fiscal year, meaning that the firm's auditor will assess ICFR during the year-end audit process. On the other hand, a firm's filing status can change from an accelerated filer to a non-accelerated filer, as well. When a firm's public float, measured on the last business day of the second fiscal quarter, falls below 50 million, a firm is reclassified as a non-accelerated filer and is no longer required to comply with SOX 404(b). Firms disclose their filing status as well as their auditors' ICFR assessment when the auditors assess ICFR on the 10-K filing.

My main research goal is to evaluate the average effects of SOX 404(b) for *all* affected firms. The rationale is that auditors' assessment of ICFR should benefit all assessed firms–no matter what the outcome of the assessment of ICFR is. The situation is similar to teachers examining their students. After an examination, all students should benefit from learning their own weaknesses. Students who get lower scores should benefit more than the students who did

extraordinary in the examination because they have more room to improve. Thus, under this research goal, I will not control for the outcome of the assessment. This research design is consistent with the previously-discussed studies (Altamuro and Beatty, 2010; Iliev, 2010; Singer and You 2011).

My sample period extends from fiscal year 2002 to fiscal year 2010, during which regulators introduced SOX 404 in stages for accelerated filers and non-accelerated filers. Figure 2 presents the regulatory events and firm filing status. The sample period starts 2002. On 1/1/2002, neither the accelerated filer nor the non-accelerated filer implements SOX 404(b), the variable of SOX 404b is equal zero for the two groups. Fiscal year ending on or after 11/25/2004, SOX 404(a) and SOX 404(b) implemented for accelerated filers. The variable of SOX 404b is equal one for the firms whose filing status are accelerated filer, and it is zero for those non-accelerated filers. Because firms' filing status may change annually, the arrows refer to some firms whose filing status are non-accelerated in year 2002 change to accelerated filing status in year 2004. The same thing happened for the accelerated filers as some firms change their filing status from accelerated filers to non-accelerated filers. One thing needs to be mentioned is that during this period, when firms change their filing status, they experience not only the change of compliance with SOX 404(b) but compliance with SOX 404(a) as well. In another words, some firms change from non-accelerated (accelerated) filer to accelerated (non-accelerated) filer, they need (need not) to comply with both SOX 404(a) and SOX 404(b). Fiscal year ending on or after 12/15/2007, SOX 404(a) implemented for non-accelerated. The last event is on 7/21/2010. The Dodd-Frank Act permanently exempts non-accelerated filers from SOX 404(b). An important fact is that after 2007, all the firms are required to comply with SOX 404(a). So when firms change their filing status, they only change compliance with SOX 404(b). In another words, when some firms change from non-accelerated filers (accelerated filers) to accelerated (non-accelerated filers), they need (need not) to comply with SOX 404(b). All the arrows in the figure demonstrate the possible changes of filing status.

For the time-series analysis, I use the full sample to test the average SOX 404 effect during the nine-year period. Then, between 2007 and 2010, I test the pure effect of SOX 404(b). During the sample period of 2002 to November, 15 2007, I test the joint effect of both SOX 404(a) and (b). Secondly, for the panel-year analysis, I conduct both fixed-effect (within-effect) and between-effect analysis.

4.2 Model Specification

I employ a firm-fixed effects model to analyze the effect of SOX 404. The dependent variables are the resultant changes to audit fees, credit rating, and Tobin's *q*. The variable of interest is SOX 404(b) required participation, *sox404b*. The fixed effects model provides consistent estimators in panel data. A firm-fixed effects model has two main advantages over other models. First, the classic merit of a fixed effects model is that it addresses the concern of omitted correlated variables. Under the setting of my study, the estimators we get from pooled OLS or random effects model will be biased if any unobserved firm characteristics—for example, firm risk or firm culture—correlate with the variable of interest, *sox404b*. In other words, although SOX 404 regulation is exogenous, there might still be endogeneity issues because compliance firms are considered less risky than non-compliance firms, leading to biased estimators. The second advantage is that a fixed effects model has unique advantages over other models, such as pooled OLS or random effects, particularly for policy analysis and program evaluation. Unlike other models, program participation estimates under fixed effects are still consistent even when correlated with persistent components in the error term (Wooldridge, 2002).

In addition to using a firm-fixed effects regression model to control for unobserved time-invariant firm characteristics, I use year dummies to control for time trends, and include extensive control variables to address firm characteristics. In the regressions for audit fees, following prior literature (Simunic 1980, Francis 1984, Davis, Ricchiute, and Trompeter 1993, O'Keefe, Simunic, and Stein 1994a, Bell, Landsman, and Shackelford 2001, Hay, Knechel, and Wong 2006, Bell, Doogar, and Solomon 2008, Doogar, Sivadasan, and Solomon 2010), I control for auditee

size, operating complexity, operating risk, financial risk, and auditee fraud risk. For the credit rating regressions, I follow recent studies (Ashbaugh-Skaife et al. 2006; Fortin and Pittman 2007; Lennox and Pittman 2011) to control for determinants of credit rating. For the Tobin's *q* regressions, following extant literature (Daske et al. 2008; Black and Kim 2012), I set extensive control variables for firm characteristics that could be correlated with Tobin's *q*. Table 1 defines the principal variables I study in this paper.

I use the following firm-fixed effects regression model:

$$\textit{Dependent Variable} = \beta_0 + \beta_1\ sox404b + \Sigma\beta_j\ Controls_j$$

Dependent Variable represents the three dependent variables: audit fees, credit rating, and Tobin's *q*. *Sox404b* is the regulation participant variable. *Sox404b* equals 1 if the firm is required to receive the auditor's assessment of ICFR in the current year. $Controls_j$ designates three sets of control variables, including two-way fixed effects.

Table 1
Variable Definition.

Panel A: variables definition for audit fees

Ln_auditfees	the natural logarithm of the audit and audit-related fees paid to the firm's auditor.
Sox404b	set equal to 1 if the firm is required to comply with Section 404(b), 0 otherwise.
Filing	number of calendar days between the auditee's fiscal year end and the 10-K filing date.
Big4	an indicator variable set equal to 1 if the firm's auditor is a Big 4 firm, 0 otherwise.
Special	an indicator variable set equal to 1 if the firm reports special items(Compustat data item SPI); 0 otherwise.
Lev	total liability divided by total asset.
Restruc	an indicator variable set equal to 1 if the firm took a restructuring charge (Compustat data item RCP or RCEPS); 0 otherwise.
Size	the natural logarithm of the total assets.
Roa	return-on-assets ratio. Calculated as operating income after depreciation, divided by total assets.
Loss	an indicator variable set equal to 1 if the firm's net income is negative, 0 otherwise.
Forop	an indicator variable set equal to 1 if the firm reports foreign currency translation value other than 0 (Compustat data item FCA), 0 otherwise.
Invrec	(total receivables + total inventories) / total assets
Busy	an indicator variable set equal to 1 if the auditee's fiscal year ends on December or January, 0 otherwise.
Merger	an indicator variable set equal to 1 if the auditee is engaged in a merger or acquisition (Compustat data item AQP or AQEPS), 0 otherwise.
Frsk	an indicator variable set equal to 1 if F-score[b] ≥ 1, zero otherwise.

Table 1 (continued)

Panel B: variables definition for credit rating

Rating	Standard & Poor's (S&P) long-term domestic issuer credit rating (COMPUSTAT data item SPLTICRM), following Jiang (2008), I convert rating letters into rating numbers. A smaller number designates a better rating. Appendix A provides the conversion table.
Ln_age	the natural logarithm of the firm's age in years.
Ln_sale	the natural logarithm of the firms' sales.
Intcov	interest expense divided by earnings before interest and taxation.
Liquidity	(current assets - inventory) divided by current liabilities.

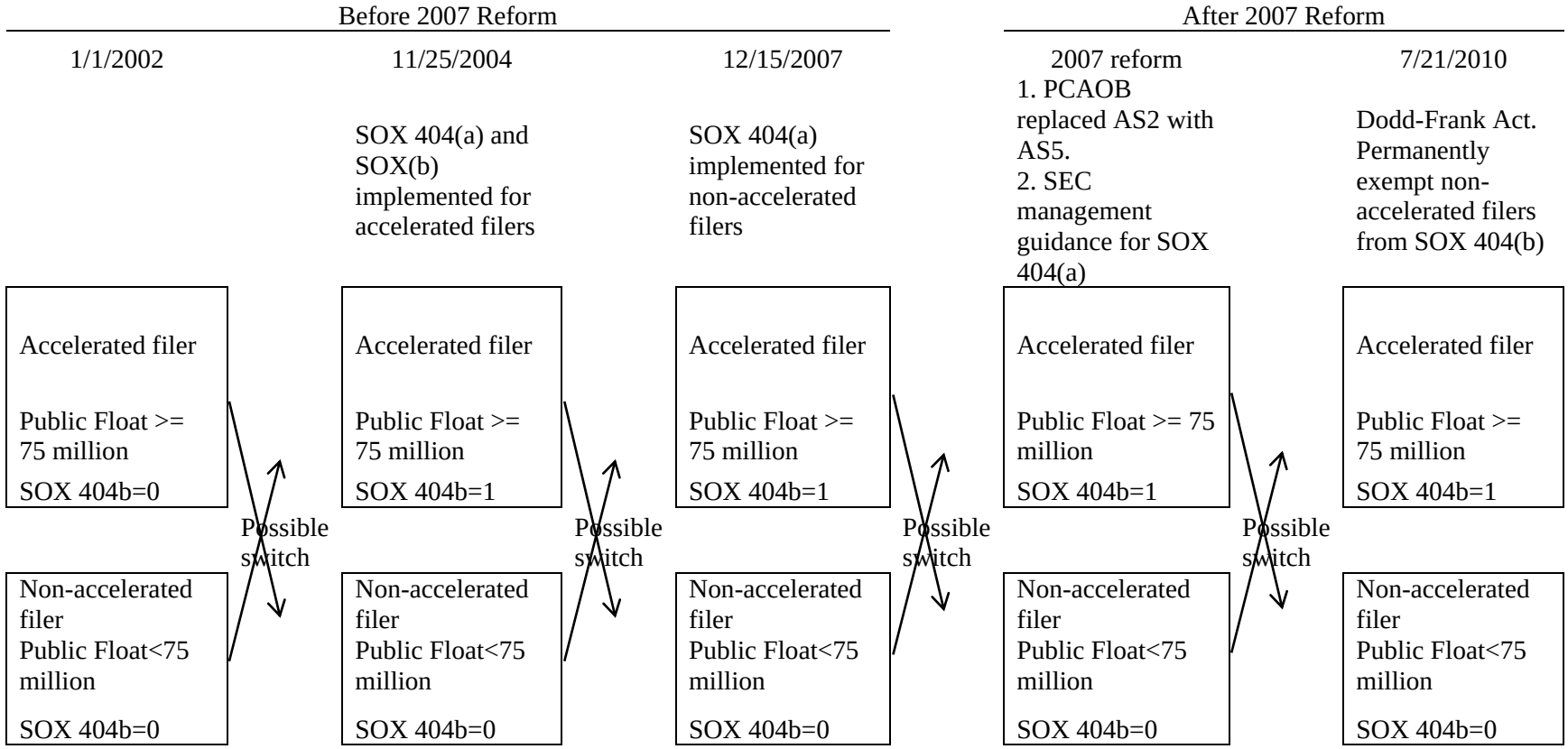
Panel C: variables definition for Tobin's *q*

Ln_tobin_q	the natural logarithm of Tobin's *q*. It calculates as (AT + ME - BE) / AT AT: total assets ME: market value at year-end BE: book value of equity. Following Daniel and Titman (1997). BE= (Stockholders Equity + Deferred Taxes + Investment tax Credit - Preferred Stock)
Salegrowth	percentage change of sales.
Ppe	ratio of property, plant, and equipment to sales.
Capital	ratio of capital expenditures to PPE.
Ebit	ratio of earnings before interest and taxes to sales.

[a] I winsorize the top and bottom of one percent of each of the continuous variables to mitigate the influence of outliers.

[b] F -score = e^{PV} /[0.00345(1 + e^{PV})]. See note 5 for each of the variable definition.

Figure 2
Regulatory Events and Firm Filing Status



Chapter 5

Sample selection

Appendix B presents the sample selection procedure. I obtain all variables from Audit Analytics and Compustat. Audit Analytics is a database provided by an independent company of the same name, and researchers in many fields (such as investment, regulation, accounting and economics) utilize it intensively. According to Audit Analytics, it covers more than 150,000 audits from the entire SEC registrar which are conducted by over 10,000 accounting firms. The data in Audit Analytics starts from the year 2000, but it does not include a complete set of 2000 year data. The audit data consists of ten modules: Audit Changes, Auditor Engagements, Audit Fees, Audit Options, Benefit Plan Options, D&O Changes, Disclosure Controls, Internal Controls, Later Files, and Restatements. I used two modules—the Audit Fees module and the Disclosure Controls module—that are critical to my research question. The Audit Fees module includes information related to audit fees, such as audit fees and audit-related fees, while the Disclosure Controls module provides information regarding filing status of each. Particularly, under the audit fees table, I obtain total audit fees by adding audit fees and audit related fees because the separate internal control assessment fees are not required for disclosure. Plus, all audit firms conduct integrated financial reporting audits and internal control audits. In another words, accelerated-filers always have the same auditor conduct both financial reporting audits and internal control audits.

Compustat includes several datasets, but I use the North America file because I am only interested in U.S. companies. The Compustat North America file contains information for publicly held companies in both annual and quarterly formats. I acquire all annual financial variables using the annual format.

To identify all firms' filing status and their SOX 404 compliance status, I review firm data in Audit Analytics from 2002 to 2010. I start from 2002, the year firms were first required to start disclosing their public floats and filing status on their 10-K filing. 2002 is the earliest date

for which filing status is available from Audit Analytics. The initial date for accelerated filers to comply with SOX 404(a) and (b) is 2004. I begin my sample two years before the initial implementation of SOX 404 and include six years of post-implementation data.

Using data from Audit Analytics, I first select all U.S. firms that have a filing status available from their Form 10-K between the fiscal years 2002 and 2010, resulting in a total number of the observations of 58,097. During fiscal years 2002 and 2003, I set all firms as non-compliance firms because none of the firms is required to comply with SOX 404(b). After 2004, I define accelerated filers as the compliance firms. *sox404b*, the primary variable of interest, is a dichotomous measure. When a firm reports its filing status as an accelerated filer, *sox404b* equals 1; otherwise, *sox404b* equals 0. My focus in this study is to examine *all* the firms that have experienced the change of not having their internal control audited to having their auditors assess internal control as well as the reverse (from audit to non-audit). The effectiveness of internal controls is not the interest of this study, so I do not collect information on the quality of internal control. Another advantage of not including an internal control effectiveness variable is that there is some missing information for this variable, and not all of the accelerated filers have complete internal control effectiveness information on Audit Analytics.

I obtain financial variables from Compustat. Following prior studies (Iliev 2010; Singer et al. 2011; Krishnan et al. 2012; Nondorf et al. 2012), I exclude financial institutions (two digit SIC codes between 60 and 69) because many of these firms are not subject to SOX 404. Those financial companies have complied with a similar regulation starting in 1991.[4] I exclude 10,490 firm-year financial companies from the sample. I identify a sample of 38,496 observations to conduct the audit fee analysis. There is much missing credit rating information on Compustat, thus 8,034 observations comprise the sample for the analysis of credit rating. The final sample for analyzing Tobin's *q* includes 30,730 observations. Comparing with audit fee and Tobin's *q*

[4] The regulation is the Federal Depository Insurance Corporation Improvement Act of 1991 (FDICIA).

sample, the number of observations in credit rating sample is much less. The fact is that credit rating agents usually favor rating big-size companies, and many small-size companies don't have the credit rating information.

Chapter 6

Data and primary results

6.1 Audit fees

6.1.1 Regression model and variables

Figure 3 layouts the research design and analyses for the audit fee analysis. The main objective for the 2007 reform is to reduce audit fees, so I conduct the analyses on the pre-2007 sample and the post-2007 sample. For each part, I conduct both time-series analysis and cross-sectional analysis. Time-series analysis refers to an analysis of the change on audit fees for the firms when they change their compliance status. It is the "firm fixed effect" or "within" model in the regression. Cross-sectional analysis refers to analysis difference in means between the two groups—accelerated filer and non-accelerated filer. It is the "between" model in the regression analyses. The hypothesis for across time analysis is that audit fees increase (decrease) when a firm switches from non-accelerated (accelerated) filers to accelerated (non-accelerated) filers. The hypothesis for cross section analysis is that accelerated filers' audit fees are greater than non-accelerated filers.

To investigate the effect of SOX 404(b) on audit fees, I examine the following regression for three sample periods. The first sample period utilizes the full sample, 2002-2010. The second is from 2002-2006, examining the early years of SOX 404, when firms who complied at all would comply with both parts (a) and (b). However, from theory, SOX 404(a)–management's assessment of ICFR—should not affect a firm's external audit fees. I use the third sample period, 2007-2010, to investigate SOX 404(b) effect on audit fees, and also whether audit fees have decreased after the 2007 reform.

$$ln\_auditfees_{it} = \beta_0 + \beta_1 sox404b_{it} + \beta_2 filing_{it} + \beta_3 big4_{it} + \beta_4 special_{it} + \beta_5 lev_{it} + \beta_6 restruc_{it} + \beta_7 size_{it} + \beta_8 roa_{it} + \beta_9 loss_{it} + \beta_{10} forop_{it} + \beta_{11} invrec_{it} + \beta_{13} busy_{it} + \beta_{14} merger_{it} + \beta_{15} frsk_{it} + \mu_{it}$$

Where:

ln_auditfees = the natural logarithm of the audit and audit-related fees paid to the firm's auditor;

sox404b = set equal to 1 if the firm is required to comply with Section 404(b), 0 otherwise (compliance vs non-compliance filing status);

filing = number of calendar days between the auditee's fiscal year end and the 10-K filing date;

big4 = an indicator variable set equal to 1 if the firm's auditor is a Big 4 firm, 0 otherwise;

special = an indicator variable set equal to 1 if the firm reports special items (Compustat data item SPI); 0 otherwise;

lev = total liability divided by total asset;

restruc = an indicator variable set equal to 1 if the firm took a reconstruction charge (Compustat data item RCP or RCEPS); 0 otherwise

size = the natural logarithm of the total assets;

roa = return-on-assets ratio. Calculated as operating income after depreciation, divided by total assets;

loss = an indicator variable set equal to 1 if the firm's net income is negative, 0 otherwise;

forop = an indicator variable set equal to 1 if the firm reports foreign currency translation value other than 0 (Compustat data item FCA), 0 otherwise;

invrec = (total receivables + total inventories) / total assets

busy = an indicator variable set equal to 1 if the auditee's fiscal year ends on December or January, zero otherwise;

merger = an indicator variable set equal to 1 if the auditee is engaged in a merger or acquisition (Compustat data item AQP or AQEPS), zero otherwise;

frsk = an indicator variable set equal to 1 if F -score[5] ≥ 1, zero otherwise. This binary variable measures the probability of audit fraud risk, from Doogar et al. (2010). Dechow et al. (2011) develop this variable.

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[5] F -score = e^{PV} /[0.00345(1 + e^{PV})]
PV = –6.789 + 0.817 Rsst_acc + 3.230 Ch_rec + 2.436 Ch_inv + 0.122 Ch_cs – 0.992 Ch_earn + 0.972Issue
Rsst_acc = [(WC_t–WC_{t-1}) + (NCO_t–NCO_{t-1})+(FIN_t–FIN_{t-1})] ÷[0.5(AT_t + AT_{t-1})]
WC = [Current Assets (ACT) – Cash and Short-Term Investments (CHE)] - [Current Liabilities (LCT) – Short-Term Debt (DLC)]
NCO =[Total Assets (AT) – Current Assets (ACT) – Long-Term Investments (IVAO)] –

I model audit fees as a function of auditee size, auditor type, firm and audit complexity, firm performance, firm operation risk and financial risk. The dependent variable is the natural logarithm of the audit and audit-related fees paid to the firm's auditor. The primary variable of interest is *sox404b*, the binary indicator indicating required compliance with SOX 404(b). It captures the effect of SOX 404(b) on audit fees.

The function of the control variables is to control for other factors that may have an association with audit fees except *sox404b*. The control variables in the above model are as follows—*filing* is the number of calendar days between the auditee's fiscal year end and the 10-K filing date. Ettredge et al. (2006) document that SOX 404 increases significantly in a firm's filing days after control for other things. Meanwhile, changing filing status affects a firm in two ways simultaneously: SOX 404(b) of auditor assessment of internal control system and reduction in 10-K filing deadline. Since December 15, 2006, the SEC requires large accelerated filers, accelerated filers and non-accelerated filers to comply with a 60-day, 75-day, and 90-day annual report deadline respectively (SEC 2005b). In order to disentangle the filing deadline reduction effect from the auditor assessment internal control effect, I include this filing period variable in the regression analysis. *big4* is an indicator variable set equal to 1 if the firm's auditor is a Big 4 firm. Raghunandan and Rama (2006), Hogan and Wilkins (2008), Hoitash et al. (2008), Krishnan et al. (2011), Hoag and Hollingsworth (2011) have documented that companies having a Big 4 accounting firm as their auditors are associated with high audit fees. I track whether special items are included because Palmrose (1986), Ashbaugh et al. (2003), Krishnan et al. (2011) have

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[Total Liabilities (LT) – Current Liabilities (LCT) – Long-Term Debt (DLTT)]

FIN = [Short-Term Investments (IVST) + Long-Term Investments (IVAO)] - [Long-Term Debt (DLTT) + Short-Term Debt (DLC) + Preferred Stock (PSTK)]

Ch_rec = $[Rec_t – Rec_{t-1}] \div [0.5(AT_t + AT_{t-1})]$

Ch_inv = $[Inv_t – Inv_{t-1}] \div [0.5(AT_t + AT_{t-1})]$ where Inv is total inventory (INVT)

Ch_cs = $(CS_t – CS_{t-1}/CS_{t-1}) * 100$ where CS is sales (SALE) less change in accounts receivable (RECT)

Ch_earn = $[Earn_t \div AT_t] – [Earn_{t-1} \div AT_{t-1}]$ where Earn is earnings (IB)

Issue = 1 if firm issued securities during the year ((SSTK) > 0 or (DLTIS) > 0), zero otherwise

documented a positive association between audit fees and the existence of special items. I include *roa, loss* and *lev* to control for firms' performance. Prior studies (e.g., Palmrose 1986; Ashbaugh et al. 2003; Doogar et al. 2010; Krishnan et al. 2011) have shown firms'audit fees are positively associated with leverage (*lev*). Ashbaugh et al. 2003, Francis et al. 2005, and Krishnan et al. 2011 have documented positive association between a firm's performance and a firm's audit fees. Following prior studies (Palmrose1986; Ashbaugh et al. 2003; Krishnan et al. 2011), I include *merger* and *restruc* to control for firms' activity in merger and restructuring. Prior literature has presented remarkably solid evidence that an auditee's size is highly positively associated with audit fees. Following Ashbaugh et al. 2003, Francis et al. 2005, Hogan and Wilkins 2008, and Krishnan et al. 2011, I use *forop* to proxy for a firm's complexity because they have documented a positive association between audit fees and a firm's complexity. Doogar et al. (2010) and Krishnan et al. (2011) have documented *invrec* is positively associated with audit fees. Doogar et al. (2010) also have documented higher audit fees for companies whose fiscal years end in December or January, which I include here in the binary variable *busy*. Finally, I adopt *frsk*, a binary variable to measure the probability of audit fraud, from Doogar et al. (2010). Dechow et al. (2011) develop this variable. Doogar et al. (2010) have shown that AS5 audit fees are positively associated with *frsk*.[6]

6.1.2 Sample Description

Table 2 reports descriptive statistics for audit fees for two groups—compliance group (*sox404b*=1) and non-compliance group (*sox404b*=0) across two time periods. Panel A reports descriptive statistics for the sample period of 2002-2010 and Panel B reports for the sample period of 2007-2010. 2002-2010 is the full sample period. However, during the year of 2002 and 2006, when a firm changes its compliance status, it experiences the change of complying with SOX 404(b) and SOX 404(a). During the sample period of 2007-2010, only the change

[6] AS5 refers Auditing Standard NO.5.

compliance status of SOX 404(b) will be captured because all the firms complied with SOX 404(a) in 2007.

The first row of Panel A in Table 2 shows that the mean (median) of the natural logarithm of audit fees for Sox 404b firms is 14.12 (14.04), while the mean (median) for non-Sox 404b firms is 12.36 (12.32) during the full sample period of 2002 - 2010. The differences in mean and median for the two groups are highly significant ($p<0.01$), and it consistent with a general expectation.[7] For other control variables, comparing with non-compliance firms, the compliance firms are more likely to hire Big 4 auditors, are bigger in terms of total assets, have a better return on asset ratio, have a lower of the sum of total receivables and total inventories which is scaled by its total assets, more likely to have special items, more likely to take a restructuring charge, have lower leverage, less likely to have December or January fiscal year ending date, less likely have the negative income, more likely to occur foreign currency transaction, have higher audit risk, have shorter filing period, and more likely to engage in the merger or acquisition activity. All the difference in mean and median for the control variables is significant ($p<0.01$). During the full sample period to conduct audit fees analysis, there are 16,858 observations in Sox 404b group, and 21,638 in non-Sox 404b group.

The first row of Panel B in Table 2 shows that the mean (median) of the natural logarithm of audit fees for Sox 404b firms is 14.12 (14.05) while the mean (median) for non-Sox 404b firms is 12.28 (12.24) during the sample period of 2007 - 2010. The differences in the mean and median for the two groups are highly significant ($p<0.01$). Compared with the full sample, the mean (median) of audit fees for the sample of 2007-2010 sample has decreased for the both groups—Sox 404b group and non-Sox 404b group. The mean or median difference for the other control variables between the two groups is very similar with the sample of 2002-2010. All the differences are highly significant. During the sample period of 2007-2010 used to conduct the

[7] I use Wilcoxon-Mann-Whitney test to test median difference for the entire study.

audit fees analysis, there are 9,577 observations in Sox 404b group, and 5,961 in non-Sox 404b group.

Table 3 reports Pearson correlation coefficients across all the variables for the full sample period of 2002-2010. Consistent with the expectation, *ln_auditfees* is significantly positively correlated with *sox404b* at 0.001 level. The dependent variable, *ln_auditfees,* is significantly correlated with all the innate characteristics of firms identified from prior studies (Palmrose1986; Ashbaugh et al. 2003; Francis et al. 2005; Ettredge et al. 2006; Raghunandan and Rama 2006; Hogan and Wilkins 2008; Hoitash et al. 2008; Doogar et al. 2010; Krishnan et al. 2011; Hoag and Hollingsworth 2011). Meanwhile, *sox404b* is significantly positively correlated with *big4*, *size*, *roa*, *special*, *restruc, busy*, and *merge* at 0.001 level, and it is significantly negatively correlated at 0.001 level with *invrec, lev, loss* and *filing*.

Table 4 presents Pearson correlation coefficients for the sample period of 2002-2006. All the correlations are identical with the correlations from the full sample. *ln_auditfees* is significantly positively correlated with *sox404b*. *Sox404b* is significantly positively correlated with *big4*, *size*, *roa*, *special*, *restruc, busy*, and *merge*, and it is significantly negatively correlated with *invrec, lev, loss* and *filing*.

Table 5 shows Pearson correlation coefficients for the sample period of 2007-2010. All the correlations are indistinguishable with both the correlations from the full sample and the correlations from the pre-2007 sample. *ln_auditfees* is significantly positively correlated with *sox404b*. *Sox404b* is significantly positively correlated with *big4*, *size*, *roa*, *special*, *restruc, busy*, and *merge*, and it is significantly negatively correlated with *invrec, lev, loss* and *filing*.

6.1.3 Regression Results

Table 6 reports within and between regressions for the sample of 2002-2006. The within estimator provides a consistent estimate of the fixed effects model.[8] A Hausman test on untabulated results yields an overall statistic of p=0.000. This leads to rejecting the random effects model. Year of 2002 - 2006 is the pre-2007 reform sample period. The expectation is that there is a significant increase in audit fees. Model 2 in table 4, within model, is the main regression model. The coefficient on the variable *sox404b* in model 2 measures the audit fees difference during sample year of 2002 to 2006 for firms that have changed their compliance status of SOX 404.[9] The coefficient is positive (0.491), and highly significant ($p<0.01$). Economically, this suggests that during 2002 to 2006, holding all else equal, when a firm changes from noncompliance to compliance, it experiences an average increase in audit fees of 63%. This is consistent with my prediction that audit fees increase after firms comply with SOX 404(b). However, the increase in audit fees could be partly due to SOX 404(a) because when the firm changed its compliance status during 2002 to 2006, it had to comply with SOX 404(b) and SOX 404(a). Obviously, this is before the 2007 reform period, and the increase in audit fees is particularly dramatic as expected. Model 1 is estimated by using only variable *sox404b.* The result is highly consistent with the results in Model 2. The coefficient is positive (0.536), and highly significant ($p<0.01$). The fact that the result is remarkably consistent in the model with or without control variables indicates that the result is unlikely affected by other independent variables. Model 4 in Table 4 is estimated by using the between regression approach. The between estimator uses levels or cross-section variations of the data. The coefficient on the variable *sox404b* in model 4 measures the difference in audit fees during sample year of 2002 to 2006 between firms that have complied with SOX 404(b) or not. The coefficient on the variable *sox404b* in Model 4 is positive (0.562), and highly significant ($p<0.01$). Model 3 provides the

[8] I also run OLS, firm random effects regressions to conduct audit fees analysis; results are similar in all cases.
[9] It includes SOX 404(a) and SOX 404(b).

between regression result after dropping all the control variables. The coefficient on the variable *sox404b* in Model 3 is positive (3.078), and highly significant ($p<0.01$). In summary, results in Table 4 provide consistent evidence that SOX 404(b) increases audit fees.

Table 7 reports estimates for within and between regressions for the sample period of 2007 to 2010. My main variable of interest, the auditor assessment of internal control variable, *sox404b*, is positively related to audit fees (t statistics = 4.93), supporting H1 and suggesting that firms with an auditor assessment internal control have higher audit fees. The economic magnitude of the coefficient on *sox404b* is also significant. The coefficient is 0.078. The results show that during 2007 – 2010, holding other known determinants of audit fees equal, when a firm changes from noncompliance to compliance, it experiences an average increase in audit fees of 8.1%. Compared with the percentage increases of 63% before 2007, it clearly suggests that after the 2007 reform, audit fees associated with compliance cost dramatically decreased. One observation is that compared with other studies (Iliev 2010; Kinney 2011), the magnitude of the increase in audit fees from the above analysis is substantially lower than from the other studies. One significant difference is that the sample period in this study is after the 2007 reform, and it includes four years of post-reform data, in which we can isolate the effects of SOX 404(b) from 404(a). In both Iliev 2010 and Kinney 2011 they only focus on the initial year of SOX 404(a) and (b). Another possible source of the differing results is that I use firm fixed-effects analysis, which uses the firm itself as the control. Turning to the control variables, except for *lev, busy*, and *forop*, the rest of the other control variables that I identified from the prior audit fees literature are significant in the expected direction. The results suggest that high audit fees are associated with firms which are more likely audited by Big4 accounting firms, are large, have high firm performance (measured as high *roa* and low *loss*), have more high-risk accounts (*invrec)*, present special items (*special*), engaged in Merger & Acquisition and restructuring activities (*merger* and *restruc* respectively), have a high probability of audit fraud (*frsk*), and long filing date (*filing*).

Figure 4 provides audit fees analysis research design, table of results, and result summary. For the pre-2007 analysis, the result of "within" analysis in Table 6 suggests the audit fee increases (decreases) dramatically when a firm changes from a non-accelerated filer (accelerated filer) to accelerated filer (non-accelerated filer). The result of "between" analysis in Table 6 suggests that accelerated filer audit fees are greater than non-accelerated filer. For after-2007 analysis, the result of "within" analysis in Table 7 suggests the audit fee increases (decreases) when a firm changes from a non-accelerated filer (accelerated filer) to accelerated filer (non-accelerated filer). The result of "between" analysis in Table 7 suggests that accelerated filer audit fees are greater than non-accelerated filer.

6.2 Credit Rating

6.2.1 Regression model and variables

I employ the following regression model to investigate the effect of SOX 404(b) on credit rating for the two sample periods. First, I use a sample period of 2002 to 2010. Then I use a sample period of 2007 to 2010. Because I am interested in the pure SOX 404(b) period, the sample period of 2007 to 2010 is my main sample period.

$$rating_{it} = \beta_0 + \beta_1 sox404b_{it} + \beta_2 ln\_age_{it} + \beta_3 big4_{it} + \beta_4 size_{it} + \beta_5 ln\_sale_t + \beta_6 intcov_{it} + \beta_7 liquidityt_{it} + \beta_8 lev_{it} + \mu_{it}$$

Where:

Rating = Standard & Poor's (S&P) long-term domestic issuer credit rating (COMPUSTAT data item SPLTICRM), following prior studies (e.g., Minton and Schrand 1999; Ahmed et al. 2002; Jiang 2008; Cassell et al. 2011), I convert rating letters into rating numbers. A smaller number designates a better rating. Appendix A provides the conversion table.

sox404b = an indicator variable set equal to 1 if the firm is required to comply with Section 404(b), 0 otherwise;

ln_age = the natural logarithm of the firm's age in years;

big4 = an indicator variable set equal to 1 if the firm's auditor is a Big 4 firm, 0 otherwise;

size = the natural logarithm of the firms' total assets;

ln_sale = the natural logarithm of the firms' sales;

intcov = interest expense divided by earnings before interest and taxation

liquidity = (current assets - inventory) divided by current liabilities

lev = total liability divided by total asset

Following prior studies (e.g., Minton and Schrand 1999; Ahmed et al. 2002; Jiang 2008; Cassell et al. 2011), I obtain the dependent variable, *rating*, from Standard & Poor's (S&P) long-term domestic issuer credit rating. I convert rating letters into rating numbers, with a smaller number designates a better rating. Following prior studies (e.g., Ashbaugh-Skaife et al. 2006; Fortin and Pittman 2007; Lennox and Pittman 2011), I include the variable of interest coverage, *intov*, which is measured as interest expense divided by earnings before interest and taxes. A lower *intov* indicates greater interest coverage. Prior literature (e.g., Ashbaugh-Skaife et al. 2006; Fortin and Pittman 2007; Lennox and Pittman 2011) has documented that higher sales, company age, company size and lower leverage are all associated with better credit rating. Thus, I include *liquidity*, *ln_sale*, *ln_age*, *size*, *lev* as control variables in the analysis. Additionally, I include an audit type variable (*big4*) because Pittman and Fortin (2004) and Cassell et al. (2011) have suggested that firms that have Big 4 auditors are associated with a better credit rating.

Figure 5 presents research design and analysis for credit rating. The analysis is conducted in two periods: full period of 2002-2010 and post 2007 period of 2007-2010. For each period, I conduct both across time analysis and cross section analysis. The across time analysis is to analyze the change in credit rating when a firm changes its compliance status. The hypothesis for across time analysis is that when a firm switches from non-accelerated (accelerated) filer to accelerated (non-accelerated) filer, its credit rating improves (deteriorates). The cross section analysis is to analyze the difference in means between accelerated-filer and non-accelerated filer. The hypothesis for cross section analysis is that accelerated filer has better credit rating than non-accelerated filer.

6.2.2 Sample Description

Table 8 reports descriptive statistics of the credit rating sample for two groups—compliance group (sox404b=1) and non-compliance group (sox404b=0). Panel A reports descriptive statistics for the sample period of 2002-2010 and Panel B reports for the sample period of 2007-2010. 2002-2010 is the entire sample period. As I mentioned before, the sample period of 2007-2010 captures the pure SOX 404(b), and the sample period of 2002 – 2010 captures SOX 404 effect.

The first row of Panel A in Table 8 shows that the mean (median) of credit rating for Sox 404b firms is 10.69 (11.00) while the mean (median) for non-Sox 404b firms is 10.9 (11.00). The difference in mean and median for the two groups are highly significant ($p<0.01$), and it is consistent with my expectation—Sox 404b firms experience a better credit rating. For other control variables, comparing with non-compliance firms, the compliance firms have better liquidity, generate larger sales, are older in terms of years they list on the Compustat, and are larger in terms of the total assets. The mean (median) of *intcov* for Sox 404b firms is 0.84 (0.47), which is smaller than non-Sox 404b firms—which is 0.92(0.51). The difference in the mean of *intcov* between the two groups is highly significant ($p<0.01$). The mean (median) of *Big4* variable for Sox 404b firms is 0.97 (1.00), and non-Sox 404b firms have the same mean and median for variable of Big4. Except for the variable *intcov* (interest coverage) and *Big4*, all the differences in mean and median for the control variables are highly significant ($p<0.01$).

The first row of Panel B in Table 8 shows, during the sample period of 2007 to 2010, the mean (median) of credit rating for Sox 404b firms is 10.74 (11.00) while the mean (median) for non-Sox 404b firms is 14.13 (15.00). The differences in mean and median for the two groups are highly significant ($p<0.01$). The mean and median differences show that Sox 404b firms experience better credit rating than non-Sox 404b firms. The mean (median) of *intcov* for Sox 404b firms is 0.8386 (0.45), which is greater than that of non-Sox 404b firms—which is 0.73 (0.23). The difference in mean is not statistically significant, and the difference in median is

highly statistically significant ($p<0.01$). Turning to other control variables, as I expect, Sox 404b firms have greater liquidity than non-Sox 404b firms—the mean (median) of *liquidity* is 2952.88 (1166.1) for Sox 404b firms, and it is 681.62 (248.65) for non-Sox 404b firms. Sox 404b firms have larger sales than non-Sox 404b firms—the mean (median) of *ln_sale* is 8.13 (8.08) for Sox 404b firms, and it is 6.69 (6.55) for non-Sox 404b firms. Sox 404b firms are older than non-Sox 404b firms—the mean (median) of *ln_age* is 3.17 (3.18) for Sox 404b firms, and it is 2.27 (2.20) for non-Sox 404b firms. Sox 404b firms are larger than non-Sox 404b firms—the mean (median) of *ln_at* is 8.39 (8.28) for Sox 404b firms, and it is 7.06 (6.60) for non-Sox 404b firms. Sox 404b firms have better leverage than that of non-Sox 404b firms—the mean (median) of *lev* is 0.62 (0.62) for Sox 404b firms, and it is 0.72 (0.75) for non-Sox 404b firms. Finally, Sox 404b firms more likely hire Big4 auditors than non-Sox 404b firms do—the mean (median) of *Big4* is 3.17 (3.18) for Sox 404b firms, and it is 2.27 (2.20) for non-Sox 404b firms. The differences in mean and median for the two groups are highly significant ($p<0.01$).

Table 9 reports Pearson correlation coefficients across all the variables during the full sample period of 2002-2010. As expected, the *rating* variable is negatively correlated with *sox404b* variable at 0.01 level. It indicates that auditor assessment of internal control is positively correlated with a better credit rating. Consistent with prior literature, firms which have Big 4 accounting firms as their auditors, older firms, large firms (measured as total assets and annual sales), firms with high liquidity, and firms with lower leverage have better credit ratings. *Rating* is negatively correlated with *big4, ln_age, size, ln_sale* and *liquidity* at 0.001 level. One exception is that interest coverage variable, *intcov*, is not significantly correlated with credit rating. Thus, SOX 404(b) firms are older, larger, have high sales volume, possess better liquidity and have lower leverage.

Table 10 presents Pearson correlation coefficients across all the variables for the sample period of 2007-2010. As expected, the *rating* variable is negatively correlated with *sox404b*

variable. Identical with correlations from the full sample, *Rating* is negatively correlated with *big4, ln_age, size, ln_sale* and *liquidity. Rating* is positively correlated with *intcov* and *lev*.

6.2.3 Regression Results

Table 11 reports two models of within regressions and two models of between regressions for the entire sample of 2002-2010.[10] The full sample period is nine years. The within estimator provides a consistent estimate of the fixed effects model. A Hausman test on untabulated results yields an overall statistic of p=0.000. This leads to rejecting the random effects model. Model 2 in table 11, within model, is the main regression model. The coefficient on the variable *sox404b* in model 2 measures the credit rating difference during sample year of 2002 to 2010 for firms that have changed their compliance status of SOX 404. The coefficient is negative (-0.26), and highly significant (p<0.01). The result suggests that after a firm changes its compliance status from non-Sox 404 firm to Sox 404 firm; it receives a better credit rating. This is consistent with my prediction that firms' cost of debt decrease after firms comply with SOX 404(b). However, the decreases in credit rating could be partly due to SOX 404(a) since when the firm changed their compliance status during 2002 to 2006, they had to comply with SOX 404(b) and SOX 404(a). Model 1 is estimated by using only variable *sox404b.* The result is highly consistent with the results in Model 2. The coefficient is negative (-0.407), and highly significant (p<0.01). The fact that the results are very consistent in the models with or without control variables indicates that the result is unlikely affected by some extraneous independent variables. Model 4 in Table 11 is estimated by using between regression. The between estimator uses levels or cross-section variations of the data. The coefficient on the variable *sox404b* in model 4 measures the difference in credit rating during sample year of 2002 to 2010 *between* firms that have complied with SOX 404(b) and the firms have not. The coefficient on the variable of *sox404b* in Model 4 is positive (0.465), and it is not significant (t=1.31). Model 3 provides the between regression result after dropping all the control variables. The coefficient on the variable

[10] I also conduct OLS and firm random effects regressions; results are similar in all cases.

sox404b in Model 3 is negative (-3.815), and highly significant (p<0.01). In summary, results in Table 11 provide evidence that SOX 404 decrease cost of debt. Turning to other control variables, in Model 2, the coefficient on the variable *intcov* is positive (0.127), and it is highly significant (p<0.001). In Model 4, the coefficient on the variable *intcov* is positive (0.517), and it is highly significant (p<0.001). The coefficient on the variable *liquidity* in Model 4 is negative (-0.0000669), and it is highly significant (p<0.01). However, it is not significant in Model 2. The coefficient on *ln_sale* in Model 2 is negative (-0.560), and it is highly significant (p<0.001), while in Model 4, it is negative (-0.989), and it is highly significant (p<0.001). The coefficient on *ln_age* in Model 2 is negative (-0.473), and it is significant (p<0.05), while in Model 4, it is negative (-1.08), and it is highly significant (p<0.001). The coefficient on *lev* in Model 2 is positive (3.740), and it is highly significant (p<0.001) while in Model 4, it is positive (4.439), and it is significant (p<0.001). The coefficients on *size* and *big4* are not significant in both models.

Consistent with prior studies (e.g., Lennox and Pittman 2011), the results in the two regression models suggest that firms have better credit rating when they have higher interest coverage (*intcov*), higher liquidity (*liquidity*), higher sales (*ln_sale*), lower leverage (*lev*), and they are usually older (*ln_age*). Furthermore, I separate the whole sample into two subsamples—investment grade (BBB- or above) and non-investment grade sample. Untabulated results show the coefficient on Sox404b is negative (-0.00056), and it is not significant for the investment grade sample; the coefficient on Sox404b is negative (-0.29), and it is highly significant (p<0.001) for the non-investment grade sample. This fact indicates that the non-investment grade observations drive the result.

Table 12 reports within and between regressions for the sample period of 2007 to 2010. My main variable of interest, the auditor assessment of internal control variable, *sox404b*, is negatively related to credit rating (t statistics = -3.64), supporting H2 and suggesting an auditor's assessment of internal control is associated with better credit rating. The economic magnitude of the -0.429 coefficient on *sox404b* is also significant. The results show that during 2007 – 2010,

holding other known determinants of credit rating equal, when a firm changes from noncompliance to compliance; it experiences an average upgrade in credit rating of 0.43 point. Turning to other variables, *credit rating* is positively related to *intcov* (t statistics = 2.08), suggesting lower interest expense coverage is associated with worse credit rating. *Credit rating* is negatively related to *ln_sale* (t statistics = -2.08) and *size* (t statistics = -2.84), suggesting large firms are associated with better credit rating. Finally, *credit rating*, is positively related to *lev* (t statistics = 7.76), suggesting lower leverage is associated with better credit rating. Year effect is also included in the model. Except for the insignificant coefficients for *liquidity*, *ln_age*, and *big4*, all the other coefficients are consistent with prior studies (e.g., Lennox and Pittman 2011). One possible explanation for this is that *big4*'s within variation of 0.0783 is too small to be estimated consistently.

Figure 6 presents research design, tables of results, and result summary for credit rating. For the across time analysis, the inference from Table 11 within analysis of full period sample and from Table 12 within analysis of post 2007 sample is that the credit rating improves (deteriorates) when a firm switches from non-accelerated filer (accelerated filer) to accelerated filer (non-accelerated filer). The inference is consistent with the hypothesis. For the cross section analysis, the inference of post 2007 period from Table 12 between analysis is that the accelerated filer has better credit rating than non-accelerated filer. However, the inference of full sample shows that there is no significant difference between the two groups from the full period sample. This inference from the cross section analysis is mixed.

6.3 Tobin's q

6.3.1 Regression model and variables

I follow the regression models used by Daske et al. (2008) and Black and Kim (2012) to investigate the effect of SOX 404(b) on Tobin's *q* under two sample periods. First, I use a sample period of 2002 to 2010. Then I use a sample period of 2007 to 2010. The results from the sample

period of 2007 to 2010 are my main focus because I am interested in the effect of SOX 404(b)isolated from that of 404(a).

$$Ln\_tobin\_q_{it} = \beta_0 + \beta_1 sox404b_{it} + \beta_2 ln\_age_{it} + \beta_3 size_t + \beta_4 lev_{it} + \beta_5 salegrowth_{it} + \beta_6 ppe_{it} + \beta_7 capital_{it} + \beta_8 merger_{it} + \beta_9 ebit_{it} + \mu_{it}$$

Where:

Ln_tobin_q = the natural logarithm of Tobin's *q*. It is calculated as (AT + ME - BE) / AT

AT: total assets

ME: market value of equity at year-end

BE: book value of equity. Following Daniel and Titman (1997),

BE= (Stockholders Equity + Deferred Taxes + Investment Tax Credit - Preferred Stock)

Salegrowth= percentage change of sales;

Ppe = ratio of property, plant, and equipment to sales;

Capital = ratio of capital expenditures to PPE;

Ebit = ratio of earnings before interest and taxes to sales;

Tobin's *q* is the ratio of the market value of assets to their book value. Market value of assets is estimated by adding the book value of debt and market value of equity. Following Daniel and Titman (1997), book value of equity is estimated by Stockholders Equity + Deferred Taxes + Investment Tax Credit - Preferred Stock. I include firm age, which is measured as the natural logarithm of the firm's age, firm size measured as the natural logarithm of the firm's total assets, sales growth measured as the percentage change of sales, fixed assets intensity (the ratio of property, plant, and equipment to sales), capital expenditure measured as the ratio of capital expenditures to PP&E, and earnings measured as the ratio of earnings before interest and taxes to sales as control variables in the model because prior studies (e.g., Black et al. 2006; Black and Kim 2012) have documented that Tobin's *q* is negatively associated with firm size, age, fixed assets intensity, and earnings.

Figure 7 outlines the research design and analysis for Tobin's *q*. Using the same methodology, I conduct across time analysis and cross section analysis for two sample periods—full period of 2002 – 2010 and post 2007 period. The analysis for across time is to analyze change in Tobin's *q*, and the hypothesis for it is when a firm switches from non-accelerated (accelerated) filer to accelerated (non-accelerated0 filer, Tobin's *q* increases (decreases). The analysis for cross section is to analyze the difference in means between accelerated filer and non-accelerated filer, and the hypothesis for it is that accelerated filer has higher Tobin's *q* than non-accelerated filer.

6.3.2 Sample Description

Table 13 reports descriptive statistics for the variables used to conduct the Tobin's *q* analysis for two groups—the compliance group (*sox404b*=1) and the non-compliance group (*sox404b*=0). The compliance group is the treatment group, and non-compliance group is the control group. Panel A reports descriptive statistics for the sample period of 2002-2010 and Panel B reports descriptive statistics for the sample period of 2007-2010. 2002-2010 is the full sample period. However, during the year of 2002 and 2006, when a firm changes its compliance status, it experiences the change of complying with SOX 404(b) and SOX 404(a). During the sample period of 2007-2010, only the change in compliance status of SOX 404(b) will be captured because all the firms complied with SOX 404(a) in 2007.

The first row of Panel A in Table 13 shows, during the sample period of 2002-2010, the mean (median) of the natural logarithm of Tobin's *q* for Sox 404b firms is 0.55 (0.46) while the mean (median) for non-Sox 404b firms is 0.44 (0.33). The differences in mean and median for the two groups are highly significant ($p<0.01$), and consistent with my expectation. Turning to other control variables, comparing with non-compliance firms, the compliance firms have lower sales growth (*salegrowth*), are bigger (*size*), have higher leverage (*lev*), have a lower ratio of tangible assets to sales (*ppe*), have less capital expenditure (*capital*), have higher operating profit margin (*ebit*), are more likely involved in merger and acquisition activities (*merger*), and are older

(*ln_age*). Except for the mean difference for *ppe*, all the differences in mean and median for the control variables are highly significant ($p<0.01$).

The first row of Panel B in Table 13 shows, during the sample period of 2007 to 2010, the mean (median) of log Tobin's *q* for Sox 404b firms is 0.47 (0.37) while the mean (median) for non-Sox 404b firms is 0.35 (0.20). The difference in mean and median for the two groups are highly significant ($p<0.01$). The mean and median differences show that Sox 404b firms have higher Tobin's *q* than non-Sox 404b firms. The mean (median) of *salegrowth* for Sox 404b firms is 0.20 (0.07), which is smaller than that of non-Sox 404b firms—which is 0.74 (0.11). Sox 404b firms are bigger in terms of the total assets than non-Sox 404b firms—the mean (median) of *size* is 6.74 (6.63) for Sox 404b firms, and it is 3.74 (3.69) for non-Sox 404b firms. Sox 404b firms have higher leverage (*lev*) than non-Sox 404b firms—the mean (median) of *lev* is 0.48 (0.48) for Sox 404b firms, and it is 0.45 (0.42) for non-Sox 404b firms. Sox 404b firms appear to have lower capital expenditures than non-Sox 404b firms—the mean (median) of *capital* is 0.20 (0.02) for Sox 404b firms, and it is 2.11 (0.62) for non-Sox 404b firms. Sox 404b firms have higher earnings than non-Sox 404b firms—the mean (median) of *ebit* is -0.34 (0.12) for Sox 404b firms, and it is -1.29 (0.03) for non-Sox 404b firms. Sox 404b firms are more likely involved in Merger&Acquisition activities than non-Sox 404b firms do—the mean (median) of *merger* is 0.14 (0) for Sox 404b firms, and it is 0.07 (0) for non-Sox 404b firms. Finally, Sox 404b firms are older than non-Sox 404b firms—the mean (median) of *ln_age* is 2.81 (2.77) for Sox 404b firms, and it is 2.45 (2.56) for non-Sox 404b firms. All the differences in mean and median for the two groups are highly significant ($p<0.01$).

6.3.3 Regression Results

Table 14 reports two models of within regressions and two models of between regressions for the Tobin's *q* analysis for the entire sample of 2002-2010.[11] All t-statistics are based on robust standard errors. The within estimator provides a consistent estimate of the fixed

[11] I also conduct OLS and firm random effects regressions; results are similar in all cases.

effects model. A Hausman test on untabulated results yields an overall statistic of p=0.000. This leads to rejecting the random effects model. Model 2 in table 14, within model, is the main regression model. The coefficient on the variable *sox404b* in model 2 measures the difference in Tobin's *q* during sample year of 2002 to 2010 for firms that have changed their compliance status for SOX 404. The coefficient is positive (0.0817), and highly significant (p<0.001). The result suggests that after a firm changes its compliance status from non-Sox 404 firm to Sox 404 firm, its Tobin's *q* increases. This is consistent with my prediction that the firms' market value premium increases after firms comply with SOX 404(b). Economically, the result suggests, during 2002-2010, when a firm changes from noncompliance to compliance status, it experiences an average increase in Tobin's *q* of 8.51%. As mentioned before, the increase in Tobin's *q* could be partly due to SOX 404(a) because when a firm changed their compliance status during 2002 to 2006, they had to comply with SOX 404(b) and SOX 404(a). Model 1 is estimated by using only variable *sox404b.* The coefficient is negative (-0.0066), and insignificant. Model 4 in table 14 is estimated by using a between regression approach. The between estimator uses levels or cross-section variations of the data. The coefficient on the variable *sox404b* in model 4 measures the difference in Tobin's *q* during the sample year of 2002 to 2010 *between* firms that have complied with SOX 404(b) and the firms have not. The coefficient on the variable of *sox404b* in Model 4 is positive (0.668), and it is highly significant (p<0.001). Model 3 provides the between regression result after dropping all the control variables. The coefficient on the variable *sox404b* in Model 3 is positive (0.144), and highly significant (p<0.001). In summary, results in Table 14 provide evidence that SOX 404 increases Tobin's *q*. Turning to other control variables, in Model 2 the coefficient on the variable *salegrowth* is positive (0.073), and it is highly significant (p<0.001). In Model 4, the coefficient on the variable *salegrowth* is positive (0.17), and it is highly significant (p<0.001). The coefficient on the variable *size* in Model 4 is negative (-0.16), and it is highly significant (p<0.001). In Model 2, the coefficient on the variable *size* is negative (-0.07), and it is highly significant (p<0.001). The coefficient on *lev* in Model 2 is positive (0.04), and it is

insignificant (t=1.30), while in Model 4, it is negative (-0.99), and it is highly significant (p<0.01). The coefficient on *ppe* in Model 2 is negative (-0.02), and it is highly significant (p<0.001) while in Model 4, it is negative (-0.03), and it is highly significant (p<0.001). The coefficient on *capital* in Model 2 is positive (0.01), and it is not significant (t=1.84) while in Model 4, it is positive (0.02), and it is significant (p<0.001). The coefficient on *ebit* in Model 2 is negative (-0.01), and it is highly significant (p<0.001) while in Model 4, it is negative (-0.03), and it is highly significant (p<0.001). The coefficient on *merger* in Model 2 is negative (-0.02), and it is highly significant (p<0.001) while in Model 4, it is negative (-0.05), and it is not significant (t=-1.34). The coefficient on *ln_age* in Model 2 is negative (-0.06), and it is significant (p<0.05) while in Model 4, it is negative (-0.02), and it is not significant (t=-1.83).

Table 15 reports within and between regressions for the sample period of 2007 to 2010. All regressions use year dummies, and all t-statistics are based on robust standard errors. My main variable of interest, the assessment internal control variable *sox404b* is positively related to *Tobin's q* (t statistic = 4.48), supporting H3 and suggesting firms which obtain an auditor's assessment of internal controls have higher Tobin's *q*. The coefficient of *sox404b* is .0827. Economically, the result shows that during 2007 – 2010, holding all else equal, when a firm switches from noncompliance to compliance, it experiences an average increase in Tobin's *q* of 8.63%. It is significant at the 0.001 level. Turning to other coefficients; *salegrowth* is positively related to Tobin's *q* (t statistics = 8.44), suggesting high sales growth associated with high Tobin's *q*. *Size* is negatively related to Tobin's *q* (t statistics = -13.52), suggesting small firms are associated with high Tobin's *q*. *Leverage* is positively associated with *Tobin's q* (t statistics = 4.18), suggesting high leverage firms are associate with high Tobin's q. *Ppe* is negatively associated with *Tobin's q* (t statistics = -2.78), indicating firms with less property, plant and equipment are associated with high Tobin's q. Finally, *merger* is negatively associated with Tobin's q (t statistics = -2.93), suggesting firms involved in merger and acquisition activities are associated with low Tobin's q.

Figure 8 presents Tobin's *q* research design, tables of results, and result summary. For across time analysis, inferences from Table 14 for the full period and inference from Table 15 for the post 2007 period show that when a firm switches from non-accelerated (accelerated) filer to accelerated (non-accelerated) filer, its Tobin's *q* increases (decreases). The inferences from the across time analysis are consistent with the hypothesis. For the cross section analysis, the inferences from Table 14 for the full period and inferences from Table 15 for the post 2007 period show that an accelerated filer has a higher Tobin's *q* than a non-accelerated filer. The inferences from cross section analysis are consistent with the hypothesis.

6.4. ***Overall inferences***

Figure 9 presents a summary of my hypotheses and inferences for this study. The hypothesis for audit fees is that audit fees increase (decrease) for companies that switch from required noncompliance (compliance) to compliance (noncompliance) with SOX 404(b). The inference is that compliance cost increases (decreases) for companies that switch from required noncompliance (compliance) to compliance (noncompliance) with SOX 404(b). The hypothesis for credit rating is that credit rating improves (deteriorates) for companies that switch from required noncompliance (compliance) to compliance (noncompliance) with SOX 404(b). The inference is that the cost of debt decreases (increases) for companies that switch from required noncompliance (compliance) to compliance (noncompliance) with SOX 404(b). The hypothesis for Tobin's *q* is that Tobin's *q* increase (decrease) for companies that switch from required noncompliance (compliance) to compliance (noncompliance) with SOX 404(b). The inference is that firm net compliance benefit increase (decrease) for companies that switch from required noncompliance (compliance) to compliance (noncompliance) with SOX 404(b). All the inferences are consistent with the hypothesis.

Table 2
Descriptive Statistics.

Panel A: 2002 - 2010

Variable	Mean		p-value for Difference	Median		p-value for Difference	n	
	Sox404b=0	Sox404b=1		Sox404b=0	Sox404b=1		Sox404b=0	Sox404b=1
Ln_auditfees	12.3618	14.1247	<0.01	12.32	14.04	<0.01	21638	16858
Big4	0.5378	0.8423	<0.01	1	1	<0.01	21638	16858
Size	4.0923	6.6403	<0.01	4.07	6.52	<0.01	21638	16858
Roa	-0.4788	0.0226	<0.01	0.02	0.07	<0.01	21638	16858
Invrec	0.2621	0.228	<0.01	0.21	0.2	<0.01	21638	16858
Special	0.5549	0.6994	<0.01	1	1	<0.01	21638	16858
Restruc	0.1918	0.3293	<0.01	0	0	<0.01	21638	16858
Lev	1.1473	0.5145	<0.01	0.54	0.49	<0.01	21638	16858
Busy	0.6863	0.762	<0.01	1	1	<0.01	21638	16858
Loss	0.5312	0.2945	<0.01	1	0	<0.01	21638	16858
Forop	0.1612	0.3	<0.01	0	0	<0.01	21638	16858
Frsk	0.7065	0.7673	<0.01	1	1	<0.01	21638	16858
Filing	87.5127	67.8267	<0.01	88	67	<0.01	21638	16858
Merger	0.0387	0.1022	<0.01	0	0	<0.01	21638	16858

Table 2 (continued)

Panel B: 2007 - 2010

Variable	Mean		p-value for Difference	Median		p-value for Difference	n	
	Sox404b=0	Sox404b=1		Sox404b=0	Sox404b=1		Sox404b=0	Sox404b=1
Ln_auditfees	12.2805	14.1231	<0.01	12.24	14.05	<0.01	5961	9577
Big4	0.2921	0.8241	<0.01	0	1	<0.01	5961	9577
Size	3.5104	6.7239	<0.01	3.53	6.62	<0.01	5961	9577
Roa	-0.6724	0.0232	<0.01	-0.03	0.07	<0.01	5961	9577
Invrec	0.2581	0.2227	<0.01	0.2	0.2	0.02	5961	9577
Special	0.52	0.7089	<0.01	1	1	<0.01	5961	9577
Restruc	0.1419	0.3488	<0.01	0	0	<0.01	5961	9577
Lev	1.4319	0.5206	<0.01	0.56	0.49	<0.01	5961	9577
Busy	0.7121	0.7527	<0.01	1	1	<0.01	5961	9577
Loss	0.6081	0.313	<0.01	1	0	<0.01	5961	9577
Forop	0.1777	0.3271	<0.01	0	0	<0.01	5961	9577
Frsk	0.6762	0.7573	<0.01	1	1	<0.01	5961	9577
Filing	87.3374	63.6754	<0.01	89	60	<0.01	5961	9577
Merger	0.0574	0.136	<0.01	0	0	<0.01	5961	9577

Panel A presents descriptive statistics for the variable used in the audit fees analyses during the sample period of 2002-2010. See Panel A of Table 1 for variable definition. I winsorize the top and bottom of one percent of each of the continuous variables to mitigate the influence of outliers. Panel B presents descriptive statistics for the variable used in the audit fees analyses during the sample period of 2007-2010.

Table 3

Correlation matrix.

Variable	*Lnauditfees*	*(1)*	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*	*(9)*	*(10)*	*(11)*	*(12)*	*(13)*
(1) Sox404b	0.5776													
	[0.000]													
(2) Big4	0.5964	0.3216												
	[0.000]	[0.000]												
(3) Size	0.8679	0.4761	0.62026											
	[0.000]	[0.000]	[0.000]											
(4) Roa	0.3603	0.1864	0.27132	0.51902										
	[0.000]	[0.000]	[0.000]	[0.000]										
(5) Invrec	-0.04	-0.0844	-0.1057	-0.0835	0.11321									
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]									
(6) Special	0.3111	0.1475	0.16968	0.23408	0.05143	-0.0243								
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]								
(7) Restruc	0.3592	0.1571	0.23078	0.2768	0.09971	0.02209	0.45547							
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]							
(8) Lev	-0.2572	-0.1508	-0.2123	-0.3923	-0.765	-0.0368	-0.0168	-0.065						
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.001]	[0.000]						
(9) Busy	0.103	0.0836	0.08676	0.09776	-0.0044	-0.1375	0.01767	-0.0028	0.0097					
	[0.000]	[0.000]	[0.000]	[0.000]	[0.3888]	[0.000]	[0.000]	[0.5862]	[0.0566]					
(10) Loss	-0.3172	0.2374	-0.2457	-0.4368	-0.3028	-0.1198	0.0626	0.04819	0.18731	0.01678				
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.001]				
(11) Forop	0.2604	0.1657	0.11683	0.1674	0.0782	0.0737	0.147	0.2081	-0.0563	-0.0193	-0.0594			
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]			
(12) Frsk	0.0481	0.0682	0.1055	0.062	0.149	0.1374	0.0449	0.0424	-0.1279	-0.0179	0.13411	0.0493		
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]		
(13) Filing	-0.4072	-0.4088	-0.3373	-0.4781	-0.2741	0.06426	-0.0445	-0.1112	0.2498	-0.067	0.2945	0.0855	0.0428	
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	
(14) Merg	0.1684	0.1265	0.0715	0.1383	0.0479	-0.0279	0.2095	0.1147	-0.0348	0.0089	-0.0387	0.0785	0.0243	0.0888
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.0819]	[0.000]	[0.000]	[0.000]	[0.000]

This table presents Pearson correlations for the variables used in the audit fees analyses. See Panel B of Table 1 for variable definition. Numbers in brackets are two-tailed *p*-values.

Table 4
Correlation matrix for audit fee: 2002-2006

	Lnauditfees	1	2	3	4	5	6	7	8	9	10	11	12	13
(1) *Sox404b*	0.5300*													
(2) *Big4*	0.5800*	0.2400*												
(3) *Size*	0.8591*	0.3837*	0.6217*											
(4) *Roa*	0.3632*	0.1465*	0.2940*	0.5235*										
(5) *Invrec*	-0.0414*	-0.065*	-0.105*	-0.085*	0.1070*									
(6) *Special*	0.2988*	0.1130*	0.1557*	0.2256*	0.0427*	-0.0365*								
(7) *Restruc*	0.3391*	0.1013*	0.2135*	0.2676*	0.0984*	0.0094	0.4524*							
(8) *Lev*	-0.2569*	-0.120*	-0.235*	-0.392*	-0.7594*	-0.0256*	-0.0152*	-0.0656*						
(9) *Busy*	0.1159*	0.1000*	0.0840*	0.1029*	-0.0028	-0.1333*	0.0211*	0.0047	0.0143*					
(10) *Loss*	-0.3195*	-0.218*	-0.249*	-0.439*	-0.3042*	-0.1365*	0.0690*	0.0678*	0.1868*	0.0136*				
(11) *Forop*	0.2496*	0.1299*	0.1219*	0.1648*	0.0778*	0.0701*	0.1331*	0.1897*	-0.0501*	-0.0127	-0.0661*			
(12) *Frsk*	0.0794*	0.0659*	0.1505*	0.1036*	0.1637*	0.1354*	0.0451*	0.0539*	-0.1339*	-0.0174*	-0.1554*	0.0498*		
(13) *Filing*	-0.3117*	-0.275*	-0.302*	-0.403*	-0.2544*	0.0539*	-0.0088	-0.0636*	0.2396*	-0.0616*	0.2797*	-0.043*	-0.0534*	
(14) *Merg*	0.1164*	0.0624*	0.0486*	0.0905*	0.0270*	-0.0192*	0.1640*	0.0791*	-0.0179*	-0.002	-0.0168*	0.0399*	0.0153*	-0.0340*

*indicates significance at 0.05 level.

Table 5
Correlation matrix for audit fee: 2007-2010

	Lnauditfees	1	2	3	4	5	6	7	8	9	10	11	12	13
(1) *Sox404b*	0.6152*													
(2) *Big4*	0.6799*	0.5330*												
(3) *Size*	0.8827*	0.6018*	0.6492*											
(4) *Roa*	0.3631*	0.2597*	0.2442*	0.5152*										
(5) *Invrec*	-0.0207*	-0.089*	-0.118*	-0.072*	0.1247*									
(6) *Special*	0.3281*	0.1909*	0.1982*	0.2427*	0.0645*	-0.0016								
(7) *Restruc*	0.3882*	0.2267*	0.2632*	0.2861*	0.1012*	0.0450*	0.4590*							
(8) *Lev*	-0.2657*	-0.210*	-0.184*	-0.396*	-0.774*	-0.054*	-0.019*	-0.064*						
(9) *Busy*	0.0728*	0.0449*	0.0991*	0.0838*	-0.0078	-0.141*	0.0098	-0.016*	0.0029					
(10) *Loss*	-0.3228*	-0.290*	-0.245*	-0.438*	-0.301*	-0.095*	0.0533*	0.0205*	0.1880*	0.0218*				
(11) *Forop*	0.2525*	0.1638*	0.1321*	0.1558*	0.0781*	0.0903*	0.1610*	0.2270*	-0.065*	-0.036*	-0.051*			
(12) *Frsk*	0.007	0.0885*	0.0423*	0.0041	0.1273*	0.1396*	0.0457*	0.0273*	-0.119*	-0.018*	-0.103*	0.0523*		
(13) *Filing*	-0.5176*	-0.522*	-0.466*	-0.587*	-0.319*	0.0599*	-0.088*	-0.175*	0.2820*	-0.062*	0.3359*	-0.103*	-0.036*	
(14) *Merg*	0.1954*	0.1242*	0.1184*	0.1714*	0.0694*	-0.027*	0.2600*	0.1453*	-0.053*	0.0115	-0.061*	0.0912*	0.0376*	-0.098*

*indicates significance at 0.05 level.

Table 6

Panel regressions for audit fees analyses during the sample year of 2002 – 2006.

	(1Within) ln_auditfees	(2Within) ln_auditfees	(3Between) ln_auditfees	(4Between) ln_auditfees
Sox404b	0.536***	0.491***	3.078***	0.562***
	(42.61)	(42.37)	(55.32)	(16.67)
Big4		0.284***		0.399***
		(14.40)		(17.01)
Size		0.313***		0.432***
		(23.35)		(82.90)
Roa		-0.0506***		-0.0762***
		(-6.08)		(-8.26)
Invrec		0.224***		0.512***
		(3.89)		(13.04)
Special		0.0450***		0.265***
		(5.94)		(10.90)
Restruc		0.0112		0.326***
		(1.16)		(12.19)
Lev		0.00420		0.0150**
		(0.76)		(2.81)
Busy		0.0969		0.0795***
		(1.23)		(4.88)
Loss		0.0715***		0.212***
		(7.75)		(9.46)
Forop		0.0358*		0.267***
		(2.07)		(12.50)
Frsk		0.0334*		-0.0717***
		(2.46)		(-3.68)
Filing		0.00338***		0.00328***
		(14.61)		(7.43)
Merger		0.0978***		0.0919
		(5.85)		(1.64)
Year effect	Y	Y	Y	Y
Cons	12.45***	10.17***	12.15***	9.112***
	(2001.42)	(112.43)	(197.02)	(144.69)
N	22958	22958	22958	22958

This table presents coefficients from panel regressions of *ln*(audit fees) on *Sox404b* and other control variables as in Panel A of Table 1 during the sample year of 2002-2006. *Sox404b* is set equal to 1 if the firm is required to comply with Section 404(b), 0 otherwise. All regression use year dummies and unbalanced panels. *, **, and *** indicate significance at 0.05, 0.01, and 0.001 levels. t statistics are reported in parentheses.

Table 7
Panel regressions for audit fees analyses during the sample year of 2007 – 2010.

	(1Within) ln_auditfees	(2Between) ln_auditfees
Sox404b	0.0780***	0.264***
	(4.93)	(10.65)
Big4	0.378***	0.432***
	(8.95)	(18.75)
Size	0.266***	0.430***
	(18.82)	(74.26)
Roa	-0.0414***	-0.0845***
	(-4.44)	(-7.84)
Invrec	0.144**	0.528***
	(2.58)	(12)
Special	0.0215**	0.257***
	(3.08)	(9.69)
Restruc	0.0171*	0.299***
	(1.96)	(11.15)
Lev	0.00734	0.0227***
	(1.31)	(3.77)
Busy	-0.0953	0.00936
	(-0.96)	(0.52)
Loss	0.0402***	0.216***
	(5.27)	(8.97)
Forop	0.0313	0.255***
	(1.86)	(12.86)
Frsk	0.0399**	0.00138
	(2.91)	(0.07)
Filing	0.00190***	0.000936
	(5.41)	(1.76)
Merger	0.0537***	0.148***
	(5.41)	(3.84)
Year effect	Y	Y
Cons	11.52***	10.12***
	(95.61)	(142.61)
N	15538	15538

This table presents coefficients from panel regressions of *ln*(audit fees) on *Sox404b* and other control variables as in Panel A of Table 1 during the sample year of 2007-2010. *Sox404b* is set equal to 1 if the firm is required to comply with Section 404(b), 0 otherwise. All regression use year dummies and unbalanced panels. *, **, and *** indicate significance at 0.05, 0.01, and 0.001 levels. t statistics are reported in parentheses.

Table 8
Descriptive statistics.

Panel A: 2002 - 2010

Variable	Mean		p-value for Difference	Median		p-value for Difference	n	
	Sox404b=0	Sox404b=1		Sox404b=0	Sox404b=1		Sox404b=0	Sox404b=1
Rating	10.9	10.69	0.01	11	11	0.007	2178	5856
Intcov	0.92	0.84	0.01	0.51	0.47	0.25	2178	5856
Liquidity	1832.64	2711.72	<0.01	621.61	1046.79	<0.01	2178	5856
Ln_sale	7.52	8.03	<0.01	7.46	7.96	<0.01	2178	5856
Ln_age	2.9	3.13	<0.01	2.94	3.18	<0.01	2178	5856
Ln_at	7.77	8.27	<0.01	7.63	8.15	<0.01	2178	5856
Lev	0.63	0.61	<0.01	0.64	0.61	<0.01	2178	5856
Big4	0.97	0.97	0.7	1	1	0.7	2178	5856

Panel B: 2007 - 2010

Variable	Mean		p-value for Difference	Median		p-value for Difference	n	
	Sox404b=0	Sox404b=1		Sox404b=0	Sox404b=1		Sox404b=0	Sox404b=1
Rating	14.1287	10.742	<0.01	15	11	<0.01	101	3318
Intcov	0.7303	0.8386	0.3714	0.23	0.45	0.0076	101	3318
Liquidity	681.6166	2952.8789	<0.01	248.65	1166.1	<0.01	101	3318
Ln_sale	6.69	8.131	<0.01	6.55	8.08	<0.01	101	3318
Ln_age	2.2746	3.1666	<0.01	2.2	3.18	<0.01	101	3318
Ln_at	7.0565	8.3902	<0.01	6.6	8.28	<0.01	101	3318
Lev	0.7151	0.6162	<0.01	0.75	0.62	<0.01	101	3318
Big4	0.7426	0.9629	<0.01	1	1	<0.01	101	3318

Panel A presents descriptive statistics for the variable used in the credit rating analyses during the sample period of 2002-2010. See Panel B of Table 1 for variable definition. I winsorize the top and bottom of one percent of each of the continuous variables to mitigate the influence of outliers. Panel B presents descriptive statistics for the variable used in the credit rating analyses during the sample period of 2007-2010.

Table 9
Correlation matrix during 2002-2010.

Variable	*rating*	*(1)*	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*
(1)Sox404b	-0.02869 [0.01]							
(2)Big4	0.15595 [0.000]	0.00435 [0.6964]						
(3)Ln_age	-0.47394 [0.000]	.13036 [0.000]	.10202 [0.000]					
(4)Size	0.59785 [0.000]	.16683 [0.000]	.18126 [0.000]	.39055 [0.000]				
(5)Ln_sale	0.59058 [0.000]	.16046 [0.000]	.19702 [0.000]	.40281 [0.000]	.86525 [0.000]			
(6)Intcov	0.00115 [0.9179]	.02369 [0.0337]	.00238 [0.8313]	.02023 [0.0698]	.01820 [0.1029]	.01161 [0.2981]		
(7)Liquidity	0.44783 [0.000]	.07707 [0.000]	.07370 [0.000]	.25012 [0.000]	.62366 [0.000]	.61413 [0.000]	.01161 [0.2981]	
(8)Lev	.23587 [0.000]	0.06670 [0.000]	0.02439 [0.0288]	.00591 [0.5963]	0.02313 [0.0381]	.01208 [0.2790]	0.01047 [0.3479]	0.06299 [0.000]

This table presents Pearson correlations for the variables used in the credit rating analyses. See Panel B of Table 1 for variable definition. Numbers in brackets are two-tailed *p*-values.

Table 10
Correlation matrix for credit rating: 2007-2010

	rating	1	2	3	4	5	6	7
(1) *Sox404b*	-0.1771*							
(2) *Big4*	-0.1861*	0.1827*						
(3) *Ln_age*	-0.4650*	0.1957*	0.1341*					
(4) *Size*	-0.6024*	0.1718*	0.2241*	0.3696*				
(5) *Ln_sale*	-0.5930*	0.1761*	0.2448*	0.3955*	0.8685*			
(6) *Intcov*	0.1383*	0.0153	0.0267	0.0724*	-0.0958*	0.1238*		
(7) *Liquidity*	-0.5312*	0.0803*	0.1121*	0.2808*	0.7018*	0.7064*	0.0396*	
(8) *Lev*	0.2697*	-0.1052*	-0.0391*	-0.0425*	-0.0405*	-0.0038	0.0175	-0.0680*

*indicates significance at 0.05 level.

Table 11
Panel regressions for credit rating analyses during the sample year of 2002 - 2010.

	(1Within) rating	(2Within) rating	(3Between) rating	(4Between) rating
Sox404b	-0.407***	-0.261**	-3.815***	0.465
	(-6.11)	(-3.29)	(-7.52)	(1.31)
Intcov		0.127***		0.517***
		(5.35)		(9.11)
Liquidity		-0.0000155		-0.0000669**
		(-0.86)		(-3.23)
Ln_sale		-0.560***		-0.989***
		(-4.28)		(-10.76)
Ln_age		-0.473*		-1.080***
		(-2.06)		(-14.70)
Size		-0.168		-0.149
		(-1.40)		(-1.51)
Lev		3.740***		4.439***
		(11.54)		(12.91)
Big4		-0.293		-0.340
		(-1.77)		(-1.25)
Year effect	Y	Y	Y	Y
Cons	11.17***	15.16***	13.06***	20.52***
	(129.17)	(15.37)	(33.88)	(37.27)
N	8034	8034	8034	8034

This table presents coefficients from panel regressions of *rating* on *Sox404b* and other control variables as in Panel B of Table 1 during the sample year of 2002-2010. *Sox404b* is set equal to 1 if the firm is required to comply with Section 404(b), 0 otherwise. All regression use year dummies and unbalanced panels. *, **, and *** indicate significance at 0.05, 0.01, and 0.001 levels. t statistics are reported in parentheses.

Table 12

Panel regressions for credit rating analyses during the sample year of 2007 – 2010.

	(1Within) rating	(2Between) rating
Sox404b	-0.429***	-0.137
	(-3.64)	(-0.34)
Intcov	0.0682*	0.664***
	(2.08)	(9.50)
Liquidity	-0.00000940	-0.000124***
	(-0.54)	(-5.90)
Ln_sale	-0.523***	-0.927***
	(-4.58)	(-7.92)
Ln_age	0.120	-1.011***
	(0.36)	(-10.83)
Size	-0.412**	0.0160
	(-2.84)	(0.13)
Lev	2.743***	5.037***
	(7.76)	(11.97)
Big4	-0.341	-0.333
	(-1.27)	(-1.08)
Year effect	Yes	Yes
Cons	17.04***	19.36***
	(10.62)	(26.62)
N	3419	3419

This table presents coefficients from panel regressions of *rating* on *Sox404b* and other control variables as in Panel B of Table 1 during the sample year of 2007-2010. *Sox404b* is set equal to 1 if the firm is required to comply with Section 404(b), 0 otherwise. All regression use year dummies and unbalanced panels. *, **, and *** indicate significance at 0.05, 0.01, and 0.001 levels. t statistics are reported in parentheses.

Table 13
Descriptive statistics.

2002 - 2010

variable	Mean		p-value for Difference	Median		p-value for Difference	n	
	Sox404b=0	Sox404b=1		Sox404b=0	Sox404b=1		Sox404b=0	Sox404b=1
Ln_tobin_q	0.4417	0.5523	<0.01	0.33	0.46	<0.01	14483	16247
Salegrowth	1.1217	0.2334	<0.01	0.27	0.1	<0.01	14483	16247
Size	4.7258	6.6346	<0.01	4.44	6.51	<0.01	14483	16247
Lev	0.458	0.4666	<0.01	0.45	0.47	<0.01	14483	16247
Ppe	1.0294	1.0162	0.61	0.38	0.39	<0.01	14483	16247
Capital	1.1472	0.2158	<0.01	0.24	0.03	<0.01	14483	16247
Ebit	-0.794	-0.4027	<0.01	0.06	0.12	<0.01	14483	16247
Merger	0.0436	0.1069	<0.01	0	0	<0.01	14483	16247
Ln_age	2.4843	2.7615	<0.01	2.48	2.71	<0.01	14483	16247

2007 - 2010

variable	Mean		p-value for Difference	Median		p-value for Difference	n	
	Sox404b=0	Sox404b=1		Sox404b=0	Sox404b=1		Sox404b=0	Sox404b=1
Ln_tobin_q	0.3541	0.4662	<0.01	0.2	0.37	<0.01	3892	9197
Salegrowth	0.7404	0.1995	<0.01	0.11	0.07	<0.01	3892	9197
Size	3.7417	6.7376	<0.01	3.69	6.63	<0.01	3892	9197
Lev	0.445	0.4757	<0.01	0.42	0.48	<0.01	3892	9197
Ppe	1.1466	1.0581	<0.01	0.33	0.4	<0.01	3892	9197
Capital	2.1115	0.2026	<0.01	0.62	0.02	<0.01	3892	9197
Ebit	-1.2889	-0.3361	<0.01	0.03	0.12	<0.01	3892	9197
Merger	0.0658	0.142	<0.01	0	0	<0.01	3892	9197
Ln_age	2.4542	2.8098	<0.01	2.56	2.77	<0.01	3892	9197

Panel A presents descriptive statistics for the variable used in the Tobin's *q* analyses during the sample period of 2002-2010. See Panel C of Table 1 for variable definition. I winsorize the top and bottom of one percent of each of the continuous variables to mitigate the influence of outliers. Panel B presents descriptive statistics for the variable used in the credit rating analyses during the sample period of 2007-2010.

Table 14
Panel regressions for Tobin's *q* analyses during the sample year of 2002 – 2010.

	(1Within) ln_tobin_q	(2Within) ln_tobin_q	(3Between) ln_tobin_q	(4Between) ln_tobin_q
Sox404b	-0.00660	0.0817***	0.144***	0.668***
	(-0.88)	(8.34)	(6.34)	(23.72)
Salegrowth		0.0733***		0.173***
		(16.22)		(13.80)
Size		-0.155***		-0.0708***
		(-15.39)		(-14.25)
Lev		0.0376		-0.0987**
		(1.30)		(-3.10)
Ppe		-0.0212***		-0.0333***
		(-4.55)		(-9.17)
Capital		0.0124		0.0211***
		(1.84)		(7.04)
Ebit		-0.0112***		-0.0311***
		(-4.18)		(-14.40)
Merger		-0.0224**		-0.0544
		(-2.62)		(-1.37)
Ln_age		-0.0572*		-0.0169
		(-2.20)		(-1.83)
Year effect	Y	Y	Y	Y
Cons	0.353***	1.109***	0.0620*	0.0248
	(60.62)	(13.38)	(2.18)	(0.48)
N	30730	30730	30730	30730

This table presents coefficients from panel regressions of *ln(*Tobin's *q)* on *Sox404b* and other control variables as in Panel C of Table 1 during the sample year of 2002-2010. *Sox404b* is set equal to 1 if the firm is required to comply with Section 404(b), 0 otherwise. All regression use year dummies and unbalanced panels. *, **, and *** indicate significance at 0.05, 0.01, and 0.001 levels. t statistics are reported in parentheses.

Table 15
Panel regressions for Tobin's *q* analyses during the sample year of 2007 – 2010.

	(1Within) ln_tobin_q	(2Between) ln_tobin_q
Sox404b	0.0827***	0.591***
	(4.48)	(23.03)
Salegrowth	0.0555***	0.186***
	(8.44)	(15.32)
Size	-0.266***	-0.0808***
	(-13.52)	(-13.81)
Lev	0.200***	0.0238
	(4.18)	(0.63)
Ppe	-0.0172**	-0.0314***
	(-2.78)	(-7.80)
Capital	0.0137	0.0245***
	(1.67)	(7.11)
Ebit	-0.00501	-0.0267***
	(-1.32)	(-11.03)
Merger	-0.0297**	-0.0650
	(-2.93)	(-1.87)
Ln_age	-0.0727	-0.0139
	(-1.40)	(-1.27)
Year effect	Y	Y
Cons	2.176***	0.448***
	(12.50)	(9.97)
N	13089	13089

This table presents coefficients from panel regressions of *ln(*Tobin's *q)* on *Sox404b* and other control variables as in Panel C of Table 1 during the sample year of 2007-2010. *Sox404b* is set equal to 1 if the firm is required to comply with Section 404(b), 0 otherwise. All regression use year dummies and unbalanced panels. *, **, and *** indicate significance at 0.05, 0.01, and 0.001 levels. t statistics are reported in parentheses.

Figure 3
Audit Fee - Research Design and Analyses

		Change Both SOX 404a and SOX 404b Status	Analysis	Hypothesis
Before analysis	Across time	Non-accelerated filer switch to accelerated filer	Analyze change on audit fee	Audit fees increase
		Accelerated filer switch to non-accelerated filer	Analyze change on audit fee	Audit fees decrease
	Cross section	Accelerated filer vs. non-accelerated filer	Analyze difference in means	Accelerated filer audit fees greater than non-accelerated filer audit fee
		Accelerated filer vs. non-accelerated filer	Analyze difference in means	Accelerated filer audit fees greater than non-accelerated filer audit fee
After analysis	Across time	Non-accelerated filer switch to accelerated filer	Analyze change on audit fee	Audit fees increase
		Accelerated filer switch to non-accelerated filer	Analyze change on audit fee	Audit fees decrease
	Cross section	Accelerated filer vs. non-accelerated filer	Analyze difference in means	Accelerated filer audit fees greater than non-accelerated filer audit fees
		Accelerated filer vs. non-accelerated filer	Analyze difference in means	Accelerated filer audit fees greater than non-accelerated filer audit fees

Figure 4
Audit Fee - Research Design, Tables of Results, and Result Summary

		Change Both SOX 404a and SOX 404b Status	Analysis	Hypothesis	Results Table		Inference
Pre 2007	Across time	Non-accelerated filer switch to accelerated filer	Analyze change on audit fees	Audit fees increase	Table 6	"Within" analyses	Audit fees increase dramatically
		Accelerated filer switch to non-accelerated filer	Analyze change on audit fees	Audit fees decrease			Audit fees decrease dramatically
	Cross section	Accelerated filer vs. non-accelerated filer	Analyze difference in means	Accelerated audit fees greater than non-accelerated filer audit fee	Table 6	"Between" analyses	Accelerated filer audit fees greater than non-accelerated filer
		Accelerated filer vs. non-accelerated filer	Analyze difference in means	Accelerated audit fee greater than non-accelerated filer audit fee			Accelerated filer audit fees greater than non-accelerated filer
Post 2007	Across time	Non-accelerated filer switch to accelerated filer	Analyze change on audit fees	Audit fees increase	Table 7	"Within" analyses	Audit fees increase
		Accelerated filer switch to non-accelerated filer	Analyze change on audit fees	Audit fees decrease			Audit fees decrease
	Cross section	Accelerated filer vs. non-accelerated filer	Analyze difference in means	Accelerated audit fees greater than non-accelerated filer audit fees	Table 7	"Between" analyses	Accelerated filer audit fees are greater than non-accelerated filer
		Accelerated filer vs. non-accelerated filer	Analyze difference in means	Accelerated audit fees greater than non-accelerated filer audit fees			Accelerated filer audit fees are greater than non-accelerated filer

Figure 5
Credit Rating - Research Design and Analysis.

		Change Both SOX 404a and SOX 404b Status	Analysis	Hypothesis
Full period	Across time	Non-accelerated filer switch to accelerated filer	Analyze change in credit rating	Credit rating improves
		Accelerated filer switch to non-accelerated filer	Analyze change in credit rating	Credit rating deteriorates
	Cross section	Accelerated filer vs. non-accelerated filer	Analyze difference in means	Accelerated filer has better credit rating than non-accelerated filer
		Accelerated filer vs. non-accelerated filer	Analyze difference in means	Accelerated filer has better credit rating than non-accelerated filer
Post 2007	Across time	Non-accelerated filer switch to accelerated filer	Analyze change on audit fees	Credit rating improves
		Accelerated filer switch to non-accelerated filer	Analyze change on audit fees	Credit rating deteriorates
	Cross section	Accelerated filer vs. non-accelerated filer	Analyze difference in means	Accelerated filer has better credit rating than non-accelerated filer
		Accelerated filer vs. non-accelerated filer	Analyze difference in means	Accelerated filer has better credit rating than non-accelerated filer

Figure 6
Credit Rating - Research Design, Tables of Results, and Result Summary

		Change Both SOX 404a and SOX 404b Status	Analysis	Hypothesis	Result Table		Inference
Full period	Across time	Non-accelerated filer switch to accelerated filer	Analyze change in credit rating	Credit rating improves	Table 11	"Within" analysis	Credit rating improves
		Accelerated filer switch to non-accelerated filer	Analyze change in credit rating	Credit rating deteriorates			Credit rating deteriorates
	Cross section	Accelerated filer vs. non-accelerated filer	Analyze difference in means	Accelerated filer has better credit rating than non-accelerated filer	Table11	"Between" analysis	No significant difference in credit rating between the two groups
		Accelerated filer vs. non-accelerated filer	Analyze difference in means	Accelerated filer has better credit rating than non-accelerated filer			No significant difference in credit rating between the two groups
Post 2007	Across time	Non-accelerated filer switch to accelerated filer	Analyze change on audit fees	Credit rating improves	Table 12	"Within" analysis	Credit rating improves
		Accelerated filer switch to non-accelerated filer	Analyze change on audit fees	Credit rating deteriorates			Credit rating deteriorates
	Cross section	Accelerated filer vs. non-accelerated filer	Analyze difference in means	Accelerated filer has better credit rating than non-accelerated filer	Table 12	"Between" analysis	Accelerated filer has better credit rating than non-accelerated filer
		Accelerated filer vs. non-accelerated filer	Analyze difference in means	Accelerated filer has better credit rating than non-accelerated filer			Accelerated filer has better credit rating than non-accelerated filer

Figure 7
Tobin's *q* - Research Design and Analyses

		Change Both SOX 404a and SOX 404b Status	Analysis	Hypothesis
Full period	Across time	Non-accelerated filer switches to accelerated filer	Analyze change in Tobin's *q*	Tobin's *q* increases
		Accelerated filer switches to non-accelerated filer	Analyze change in Tobin's *q*	Tobin's *q* decreases
	Cross section	Accelerated filer vs. non-accelerated filer	Analyze difference in means	Accelerated filer has higher Tobin's *q* than non-accelerated filer
		Accelerated filer vs. non-accelerated filer	Analyze difference in means	Accelerated filer has higher Tobin's *q* than non-accelerated filer
Post 2007	Across time	Non-accelerated filer switches to accelerated filer	Analyze change in Tobin's *q*	Tobin's *q* increases
		Accelerated filer switches to non-accelerated filer	Analyze change in Tobin's *q*	Tobin's *q* decreases
	Cross section	Accelerated filer vs. non-accelerated filer	Analyze difference in means	Accelerated filer has higher Tobin's *q* than non-accelerated filer
		Accelerated filer vs. non-accelerated filer	Analyze difference in means	Accelerated filer has higher Tobin's *q* than non-accelerated filer

Figure 8

Tobin's *q* - Research Design, Tables of Results, and Result Summary

		Change Both SOX 404a and SOX 404b Status	Analysis	Hypothesis	Result Table		Inference
Full period	Across time	Non-accelerated filer switch to accelerated filer	Analyze change in Tobin's *q*	Tobin's *q* increases	Table 14	"Within" analysis	Tobin's *q* increases
		Accelerated filer switch to non-accelerated filer	Analyze change in Tobin's *q*	Tobin's *q* decreases			Tobin's *q* decreases
	Cross section	Accelerated filer vs. non-accelerated filer	Analyze difference in means	Accelerated filer has higher Tobin's *q* than non-accelerated filer	Table 14	"Between" analysis	Accelerated filer has higher Tobin's *q* than non-accelerated filer
		Accelerated filer vs. non-accelerated filer	Analyze difference in means	Accelerated filer has higher Tobin's *q* than non-accelerated filer			Accelerated filer has higher Tobin's *q* than non-accelerated filer
Post 2007	Across time	Non-accelerated filer switch to accelerated filer	Analyze change in Tobin's *q*	Tobin's *q* increases	Table 15	"Within" analysis	Tobin's *q* increases
		Accelerated filer switch to non-accelerated filer	Analyze change in Tobin's *q*	Tobin's *q* decreases			Tobin's *q* decreases
	Cross section	Accelerated filer vs. non-accelerated filer	Analyze difference in means	Accelerated filer has higher Tobin's *q* than non-accelerated filer	Table 15	"Between" analysis	Accelerated filer has higher Tobin's *q* than non-accelerated filer
		Accelerated filer vs. non-accelerated filer	Analyze difference in means	Accelerated filer has higher Tobin's *q* than non-accelerated filer			Accelerated filer has higher Tobin's *q* than non-accelerated filer

Figure 9
Summary of Hypothesis and Inference

	Hypothesis	Inference Summary
Audit Fees	Audit fees increase(decrease) for companies that switch from required noncompliance (compliance) to compliance (noncompliance) with SOX 404(b)	Compliance cost increases (decreases) for companies that switch from required noncompliance (compliance) to compliance (noncompliance) with SOX 404(b)
Credit Rating	Credit rating improves (deteriorates) for companies that switch from required noncompliance (compliance) to compliance (noncompliance) with SOX 404(b)	Cost of debt decreases (increases) for companies that switch from required noncompliance (compliance) to compliance (noncompliance) with SOX 404(b)
Tobin's *q*	Tobin's *q* increase (decrease) for companies that switch from required noncompliance (compliance) to compliance (noncompliance) with SOX 404(b)	Firm net compliance benefit increase (decrease) for companies that switch from required noncompliance (compliance) to compliance (noncompliance) with SOX 404(b)

Chapter 7

Example and further analysis

7.1 An example

My results indicate that SOX 404(b) increases firms' audit fees, upgrades firms' credit rating, and improves overall firm value premium. It would be appealing to find out how SOX 404(b) affects a firm monetarily.

One example is Allis-Chalmers. Allis-Chalmers's 10-K annual report for fiscal year 2005 declares the company as a non-accelerated filer, and its auditor, UHY Mann Frankfort Stein & Lipp CPAs, does not assess the company's internal control over financial reporting that year. In fiscal year 2006, Allis-Chalmers's aggregate market value of the common equity held by its non-affiliates is $139,745,249, which is above the threshold of $75 million. In the 2006 10-K, Allis-Chalmers files as an accelerated filer. The same auditor, UHY, assesses and presents its opinion that Allis-Chalmers maintains an effective internal control over financial reporting in the 10-K annual report. The total audit fees incurred in 2005 was $632,612 while in 2006, the total was $850,223-an increase of $217,611, which in terms of a percentage is 34.40%. We assume the increase in audit fees represents the cost of having an auditor assess Allis-Chalmers' internal control system in order to achieve SOX 404(b) compliance. Then, let us turn to find the monetary benefit that having an auditors' assessment brings to Allis-Chalmers. The Loan Pricing Company (LPC) *Dealscan* database comprises a variety of historical bank loan data. Searching *Dealscan* from 2002 to 2009, I find ten instances of borrowing by Allis-Chalmers. The active dates for the ten deals are: one on 2/1/2002, three dated on 12/7/2004 and another three on 7/11/2005, one on 1/18/2006, one on 4/26/2007 and one on 12/3/2007. Because Allis-Chalmers' fiscal year ending date is December 31, the deal with an active date of 1/18/2006 should be the last deal closed before the first assessment of Allis-Chalmers's internal control was completed. The deal with an active date of 4/26/2007 was made after Allis-Chalmers's auditor audited its internal control system for fiscal year 2006. The interest rate in *Dealscan* calls drawn all-in

spread over LIBOR (i.e., *AIS*). The *AIS* in the pre-assessment deal is 300.00 basis points, and it is 175.00 basis points for the after-assessment deal. The interest rate has dropped by 125.00 basis points. We can estimate the monetary interest saving for Allis-Chalmers as follow: The average amount of Allis-Chalmers loan facility is $25,733,500, and the mean maturity of the loan is 38.3 months, or 3.18 years. That shows that after having its auditor assesses the internal control system, Allis-Chalmers has saved estimated annual interest expenses of $321,668.75. Compared to the increased audit fee cost of $217,611, the net annual savings for Allis-Chalmers is $104,057.75. The Allis-Chalmers's example provides evidence that the benefit of the auditors' assessment of internal control system outweighs the cost.

7.2 Further Analysis

7.2.1 Move up and Move down sample

In the within regression analysis, only the firms which experience variation in SOX 404(b) compliance status were identified. The variation could be either firms switching from the non-accelerated filer to accelerated filer, or the reverse. In addition, some firms experienced both changes. In order to address the concern that the results are only driven by one of the two changes, dividing the sample into two subsamples—the move up sample and the move down sample—I conduct the same analysis under each subsample. The move up sample includes firms which at some point in the data cross the threshold with moves them from non-compliance to compliance. While the move down sample consists of firms that have changed from having an auditors' assessment of the internal control system to no longer receiving that assessment in at least one firm-year.

Untabulated analyses of panel regressions for the audit fees show the coefficient for *sox404b* is positive (0.38) for the move-up group, and it is 0.30 for the move-down group.[12] Both of the coefficients are significant at 0.001 levels. The results are consistent with the result from

[12] All panel regressions in this entire study use year dummies and robust standard errors.

the entire sample.[13] For other control variables, all the coefficients between the two subsamples are highly consistent. They are also consistent with the whole sample as well. This analysis provides evidence that the results are not driven by only one of the subsamples.

I conduct the same analyses for credit rating for the two subsamples—move-up firms and move-down firms. The results are consistent between the two subsamples. The coefficient of *sox404b* is negative (-0.13), and it is significant ($p<0.05$) for the move-up sample. The coefficient of *sox404b* is -0.7, and it is highly significant ($p<0.001$) for the move-down sample. The results are consistent with the result from the entire sample. From Table 9, we know the coefficient of *sox404b* for the full sample is -0.26, and it is highly significant ($p<0.001$). For other control variables, the coefficients are very similar between the two subsamples. The coefficients are also consistent with the results from the entire sample.

Last, I conduct the same fixed effects regressions for Tobin's *q* for the two subsamples. For the move-up sample, the coefficient of *sox404b* is positive (0.12), and it is significant at 0.001 level. The coefficient of *sox404b* is 0.23 for the sample of the move down, and it is significant at 0.001 level. The results of all the rest of the control variables are consistent between the two groups. For most of the variables, they are also consistent with the results from the entire sample. One exception is the coefficient for the *merger* variable. It is not significant for the two subsamples, and it is significantly negative at 0.01 level from the full sample.

In summary, all the three results still hold after I separate the sample into the move-up sample and the move-down sample. The results in this section are consistent with the primary results, which indicate the results are not driven by one of the subsamples.

7.2.2 Merge & Acquisition

About 6.7% of the sample has a merger and acquisition during the sample period of 2002 to 2010. A concern is whether those firms which experience a merger and acquisition are

[13] Untabulated analyses show for the entire sample, the coefficient of sox404b is positive (0.34), and it is highly significant ($p<0.01$).

systematically different from those without a merger&acqusition, and thus drive the results. I separate the whole sample into two subsamples—merger sample and non-merger sample—and then rerun the analyses. Merger sample (*merger* = 1) includes the firms that have a merger and acquisition activity and non-merger (*merger* = 0) sample firms do not have a merger and acquisition during the sample period between 2007 and 2010. Among the three tests—audit fees, credit rating, and Tobin's *q*, I am unable to conduct the credit rating test because there are not sufficient observations in the merger sample.

Untabulated analyses of panel regressions for audit fees show the coefficient of *sox404b* is positive (0.24), and it is highly significant for the Merger&Acquisition sample. The coefficient of *sox404b* is 0.35 for the non-Merger&Acquisition sample. Both of the coefficients are significant at 0.001 levels. The results are consistent with the result from the entire sample. Turning to the control variables, all the coefficients between the two subsamples are highly consistent. They are also consistent with the whole sample as well. This analysis provides evidence that the results are not driven by only one of the subsamples.

Next, I conduct the same analyses for Tobin's *q* for the two subsamples—merger firms and non-merger firms. The results are consistent between the two subsamples. The coefficient of *sox404b* is positive (0.38), and it is highly significant ($p<0.01$) for the merger sample. The coefficient of *sox404b* is positive (0.66), and it is highly significant ($p<0.001$) for the non-merger sample. The results are consistent with the result from the entire sample. For other control variables, the coefficients are very similar between the two subsamples. The coefficients are also consistent with the results from the entire sample.

The above results demonstrate that merger and acquisition activity does not drive the results in the audit fees and Tobin's *q* models.

7.2.3 Industry-adjusted Tobin's q

Considering the variation among industries, I run the above models by using industry-adjusted Tobin's *q*. The industry-adjusted Tobin's *q* for a company is the difference between its

own Tobin's *q* and the mean Tobin's *q* for its industry. Industry is defined at the two-digit SIC level. I also compute industry-adjusted Tobin's *q* by taking the difference between its own Tobin's *q* and the median Tobin's *q* for its industry. The untabulated results show they provide consistent results for both measures of industry-adjusted Tobin's *q*.

Untabulated analyses of panel regressions for industry-adjusted Tobin's *q* during the sample period of 2002-2010 show that the coefficient of *sox404b* is positive (0.21) and it is highly significant ($p<0.001$). The results are consistent with the results from the entire sample. Except for the coefficient of *merger*, all the rest of coefficients of the control variables present exactly the same results as using the raw Tobin's *q*.[14]

Table 16 reports panel regressions using industry-adjusted Tobin's *q* as the dependent variable for the sample period of 2007-2010. Model 1 in table 16, within model, is the main regression model. The coefficient of *sox404b* in model 1 is positive (0.239), and highly significant ($p<0.001$). The economic magnitude of the coefficient on *sox404b* is also significant. It shows that if we measure at the sample mean (mean industry-adjusted Tobin's q is 0.46 from untabulated results), the difference between SOX 404(b) compliance and SOX 404(b) non-compliance's industry-adjusted Tobin's *q* is 51.96% (0.239 divided by 0.46). Model 2 in table 16 is estimated by using the between regression approach. The coefficient on the variable *sox404b* in Model 2 is positive (0.847), and highly significant ($p<0.001$). Turning to the control variables in the within model, the coefficient on *salegrowth* is positive (0.07), and it is highly significant ($p<0.001$); the coefficient on *size* is negative (-0.67), and it is highly significant ($p<0.001$); the coefficient on *lev* is positive (0.37), and it is significant ($p<0.05$); the coefficient on *ppe* is negative (-0.11), and it is highly significant ($p<0.001$); the coefficient on *ebit* is negative (-0.03), and it is significant ($p<0.05$). Similar with the results from the raw Tobin's *q* regression, the

[14] The coefficient of merger in adjusted-Tobin's *q* regression is negative (-0.0085), and it is not significant. However, it is negative (-0.02), and it is highly significant in raw Tobin's *q* regression.

results suggest that a high Tobin's *q* is associated with high sales growth, small firm size, high leverage, less tangible assets intensity.

7.3 Inference summary for robustness checks

Figure 10 summarizes the robustness checks and associated inferences. I conducted three robust analysis, and I utilize within model for all the analyse. The first robust analysis is that I separate the sample into move-up group and move-down group. The inference is that audit fees increase for move-up group; audit fees decrease for move-down group. The inference for credit rating analysis is that credit rating improves for move-up group; credit rating deteriorates for move-down group. The inference for Tobin's *q* analysis is that Tobin's *q* increases for move-up group; Tobin's *q* decreases for move-down group.

Secondly, I separate the sample into Merger&Acqusition group and non-Merger&Acqusition group. The inference is that audit fees increase (decrease) for companies that switch from required noncompliance (compliance) to compliance (noncompliance) with SOX 404(b) for the both of the groups. There are not enough observations to conduct credit rating analysis after I separate the sample. For Tobin's *q*, the inference is that Tobin's *q* increases (decreases) for companies that switch from required noncompliance (compliance) to compliance (noncompliance) with SOX 404(b) for the both of the Merger&Acqusition group and non-Merger&Acqusition group.

Lastly, I replaced raw Tobin's *q* with industry-adjusted Tobin's *q*. The inference is that industry-adjusted Tobin's *q* increases (decreases) for companies that switch from required noncompliance (compliance) to compliance (noncompliance) with SOX 404(b).

Table 16

Panel regressions for adjusted-industry Tobin's *q* analyses during the sample year of 2007 – 2010.

	(1within) adjusted_q	**(2between) adjusted_q**
Sox404b	0.239***	0.847***
	(3.76)	(11.74)
Salegrowth	0.0734***	0.262***
	(3.46)	(7.66)
Size	-0.673***	-0.112***
	(-10.40)	(-6.79)
Lev	0.369*	0.446***
	(2.16)	(4.22)
Ppe	-0.106***	-0.0955***
	(-4.03)	(-8.44)
Capital	0.0427	0.0613***
	(1.79)	(6.33)
Ebit	-0.0315*	-0.0347***
	(-2.37)	(-5.11)
Merger	-0.0321	-0.310**
	(-0.88)	(-3.18)
Ln_age	-0.362	0.0755*
	(-1.90)	(2.46)
Year effect	Y	Y
Cons	4.129***	-1.537***
	(6.83)	(-12.18)
N	13089	13089

This table presents coefficients from panel regressions of industry-adjusted Tobin's *q* on *Sox404b* and other control variables as in Panel C of Table 1 during the sample year of 2007-2010. *Sox404b* is set equal to 1 if the firm is required to comply with Section 404(b), 0 otherwise. Industy-adjusted Tobin's q is calculated as the difference between its own Tobin's *q* and the mean Tobin's *q* for its industry. Industry is defined at the two-digit SIC level. All regression use year dummies and unbalanced panels. *, **, and ***indicate significance at 0.05, 0.01, and 0.001 levels. t statistics are reported in parentheses.

Figure 10

Analysis of Robustness Checks and Associated Inferences

Procedure	Model	Sample	Inference - Audit fees	Inference - Credit rating	Inference - Tobin's *q*
Separate sample into move-up group and move-down group	Within analysis	move-up group	Audit fees increase for companies that switch from required noncompliance to compliance with SOX 404(b)	Credit rating improves for companies that switch from required noncompliance to compliance with SOX 404(b)	Tobin's *q* increases for companies that switch from required noncompliance to compliance with SOX 404(b)
		move-down group	Audit fees decrease for companies that switch from required compliance to noncompliance with SOX 404(b)	Credit rating deteriorates for companies that switch from required compliance to noncompliance with SOX 404(b)	Tobin's *q* decreases for companies that switch from required compliance to noncompliance with SOX 404(b)
Separate sample into Merger& Acquisition group and non-Merger& Acquisition group	Within analysis	Merger& Acquisition group	Audit fees increase(decrease) for companies that switch from required noncompliance (compliance) to compliance (noncompliance) with SOX 404(b)	N/A. Not enough observations to conduct analysis	Tobin's *q* increase(decrease) for companies that switch from required noncompliance (compliance) to compliance (noncompliance) with SOX 404(b)
		non-Merger& Acquisition group	Audit fees increase(decrease) for companies that switch from required noncompliance (compliance) to compliance (noncompliance) with SOX 404(b)	N/A. Not enough observations to conduct analysis	Tobin's *q* increase(decrease) for companies that switch from required noncompliance (compliance) to compliance (noncompliance) with SOX 404(b)
Replace raw Tobin's *q* with industry-adjusted Tobin's *q*	Within analysis	N/A	N/A	N/A	Industry-adjusted Tobin's *q* increase(decrease) for companies that switch from required noncompliance (compliance) to compliance (noncompliance) with SOX 404(b)

Chapter 8

Conclusion

In this study I document results consistent with SOX 404(b) imposing compliance costs, but also decreasing firms' cost of debt, and overall, SOX 404(b) produces a net compliance benefit of around 8.63%. These Results are robust to using industry-adjusted Tobin's q, separating the sample by firms which switch between noncompliance and compliance status, and splitting the sample into Merger&Acquisition and non-M&A groups. Overall, the evidence in this study provides consistent results that SOX 404(b) does bring a net compliance benefit to firms.

As a caveat, I recognize that I cannot include all compliance costs and benefits. The 2009 SEC survey (SEC 2009) particularly recognized four types of compliance costs. They are as follows: (1) audit fees paid to an external auditor, (2) consulting fees paid to an external vendor that are unrelated to audit fees, (3) internal employee labor expenses related to SOX 404(b), and (4) other non-labor expenses, such as software or travel expenses. Among the four types of costs, only audit fee data is publicly available, and it is hard to obtain or even measure the other three. The 2009 SEC survey (SEC 2009) categorized compliance benefits as direct or indirect. Direct benefits included improvements in internal control structure, audit committee's confidence in company, financial reporting quality, the ability to prevent and detect fraud, efficiency of generating financial reporting, and timeliness of auditing financial report. On the other hand, the indirect benefits of an improved capability to raise capital, as well as increases in investors' confidence, operation efficiency, the liquidity of company's common stock, and overall company value. It is almost impossible to measure all the comprehensive benefits.

Even with these limitations, this study makes several contributions to the literature. First, this study fills a gap in the current literature by being the first to address the question: "Does SOX 404(b) bring a net compliance benefit to shareholders?" Utilizing a cost-benefit analysis methodology, this study answers that question in the affirmative. Other extant studies have looked only at the resultant audit fee reductions after the 2007 reforms (e.g., Doogar et. 2010;

Hoag et al. 2011; Kinney et al. 2011; Krishnan et al. 2011), and only two have documented how complying with SOX 404(b) benefits firms in discovering internal control weakness problems and in improving revenue quality (Bedard and Graham 2011 Krishnan and Yu 2012). To my knowledge, none of studies have presented evidence regarding how SOX 404(b) affects *overall* firm value premium. Using Tobin's *q* to proxy for the net compliance benefit, this study documents on average, when a firm changes from noncompliance to compliance status, it experiences an 8.63% increase in firm value premium. Additionally, after removing the variations among different industries by replacing the raw Tobin's *q* with an industry-adjusted Tobin's *q*, the result is even stronger—it shows an increase in firm value premium of 51.96%. This result is robust under different procedures. Firstly, I separate the sample into two subsamples: a sample of moved up firm-years and a sample of moved-down firm-years.[15] I conduct the same regression analysis under the two subsamples. The regression results show that the coefficient which measures the percentage change in firm value premium, *sox404b*, for both subsamples is significant at 0.001 level. The coefficients for moved-up firm-year and moved-down firm-year are 0.12 and 0.23 respectively. According to the results, moving into compliance status increases firm value premium by 12.75%, but falling to non-compliance status decrease value premium by 25.86%.

Secondly, I partition the sample into two subsamples based on whether firms have experienced Merger&Acquisition activity. The coefficient on *sox404b* for the regression for the sample of non-merger firms is 0.663, and it is statistically significant at 0.001 level. The coefficient of *sox404b* for the regression for the sample of merger firms is 0.379, and it is statistically significant at the 0.01 level. In summary, this study provides consistent evidence that SOX 404(b) does bring value premium to shareholders.

[15] A sample of moved up firms refers to the firm-years that have changed from noncompliance status to compliance status. On the other side, a sample of moved down firms refers to the firm-years that have changed from compliance status to noncompliance status. The reason to use firm-year is because for some individual firms, they have experienced both changes in different years.

This study also contributes evidence to the current debate on the wisdom of exempting non-accelerated filers from SOX 404(b). Unlike prior studies (Iliev 2010; Bedard et al. 2011; Kinney et al. 2011), this study investigates SOX 404(b) over a longer time frame. A long-term cost-benefit analysis is critical toward deciding whether small firms should be exempt from SOX 404(b). According to the SEC's Chairman William H. Donaldson's statement, the goal of SOX 404(b) is to provide long-term benefits to investors (SEC 2005a). We could think of the whole procedure of auditor assessment of internal control as an investment for shareholders. It seems to be extremely costly at the beginning; however, the returns are generated over a long period of time.

More broadly, this study also sheds lights on whether small firms should be exempted from many regulations which may only be useful when applied to larger firms. In theory, the audit exists to reduce the information asymmetry problem. Likewise, the purpose of many regulations is the same. However, compared with large firms, the information asymmetry is even more pronounced with smaller firms. It would be antithetical to exempt from regulation the firms which are most in need of reduction in information asymmetry.

This study benefits policymakers. While prior research identifies specific costs and benefits of SOX 404(b), the net overall effects of the legislation have not been settled. This study finds that firm value premium increased for firms subject to SOX 404(b), suggesting that the entities which bore the greatest costs to comply with the legislation—firms and their shareholders—nonetheless benefitted from its passage. This stands in contrast to post-legislation backlash by firms which voiced concerns that costs of complying with SOX 404(b) outweighed the benefits of doing so.

The study also benefits firm shareholders and boards of directors. In my study, firms subject to SOX 404(b) provisions experience benefits in reduced cost of debt and cost of equity capital that exceed the costs to comply with the provisions. These findings compliment Cassell et al. (2011) who find that the net benefit in firm value extends also to small firms which voluntarily

adopt SOX 404(b) compliance. Taken together, these results suggest that increased internal control, particularly under the SOX 404(b) provisions, has benefitted shareholders; efforts directed at rolling back SOX provisions to reduce compliance costs may do more harm than good.

In addition, this study also should be of interest to auditors. Assessment of internal control is a new task for auditors. Unclear policy guidance and the learning curve make this task difficult for auditors. Auditors also face the pressure of reducing audit fees. For auditors who have done the assessment or will do it, it is inspiring to determine that their efforts are valuable. The results in this study will encourage auditors to continue to do their duty.

Finally, this study should interest management as well. Particularly, this study provides an incentive for small firms' management to consider complying with SOX 404(b). The results should convince management that regulation will not always bring too heavy a compliance burden to the firms, and firms can benefit from regulations such as SOX 404(b).

To summarize, the results in this study clearly suggest that after the 2007 reform, as compliance costs have dropped dramatically, the benefit of SOX 404(b) outweighs the cost. This study indicates that it is may be unwise to exempt small firms from SOX 404(b).

Appendices

Appendix A.
Credit rating conversion

S&P Credit Rating Letter	Rating	Freq	Percent
AAA	1	53	0.66
AA +	2	9	0.11
AA	3	65	0.81
AA-	4	88	1.1
A+	5	229	2.85
A	6	510	6.35
A-	7	444	5.53
BBB+	8	593	7.38
BBB	9	969	12.06
BBB-	10	793	9.87
BB+	11	556	6.92
BB	12	799	9.95
BB-	13	1,118	13.92
B+	14	884	11
B	15	525	6.53
B-	16	276	3.44
CCC+[1]	17	123	1.53

[1]This category includes all the credit rating equal or below CCC+.

Appendix B. Sample selection

Sample Selection – Audit Fees	
Audit Analytics data 2002-2010	58,097
Remove SIC 6000 – 6999 observations	(10,490)
Merge with Compustat to obtain financial control variables	(9,111)
Final sample	38,496
Sample Selection – Credit Rating	
Audit Analytics data 2002-2010	58,097
Remove SIC 6000 – 6999 observations	(10,490)
Merge with Compustat to obtain financial variables	(39,573)
Final sample	8,034
Sample Selection – Tobin's *q*	
Audit Analytics data 2002-2010	58,097
Remove SIC 6000 – 6999 observations	(10,490)
Merge with Compustat to obtain financial variables	(16,877)
Final sample	30,730

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