



# Economic consequences of the Sarbanes–Oxley Act of 2002<sup>☆</sup>

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## Abstract

This paper investigates the economic consequences of the Sarbanes–Oxley Act (SOX) by examining market reactions to related legislative events. Using concurrent stock returns of non-U.S.-traded foreign firms to estimate normal U.S. returns, I find that U.S. firms experienced a statistically significant negative cumulative abnormal return around key SOX events. I then examine the cross-sectional variation of U.S. firms' returns around these events. Regression results are consistent with the non-audit services and governance provisions imposing net costs. Additional tests show that deferring the compliance of Section 404, which mandates an internal control test, resulted in significant cost savings for non-accelerated filers.

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## 1. Introduction

The extant literature provides mixed evidence regarding the consequences of securities legislation. Early studies (e.g., Stigler, 1964; Benston, 1973) find no support for the benefits of the Securities Acts of 1933 and 1934, but the methodology and the interpretation of these studies have been challenged subsequently (Schwert, 1981; Friend and Westerfield, 1975). More recently, Bushee and Leuz (2005) document positive externalities but also significant costs of extending disclosure requirements to OTCBB firms in 1999. In contrast, Greenstone et al. (2006) found that firms required by the 1964 Securities Act Amendments to increase disclosures experienced a positive return around the announcement of the law.

While the impact of existing securities legislation is still under debate, Congress passed the Sarbanes–Oxley Act (the Act or SOX hereafter) in July 2002, in response to a number of high-profile scandals starting in late 2001. The Act has been widely considered the most far-reaching securities legislation since the Securities Acts of 1933 and 1934.<sup>1</sup> It not only imposes additional disclosure requirements, but more importantly, proposes substantive corporate governance mandates, a practice that is unprecedented in the history of federal securities legislation (Romano, 2004).

By requiring more oversight, imposing greater penalties for managerial misconduct, and dealing with potential conflicts of interest, the Act aims to prevent deceptive accounting and management misbehavior. However, despite the claimed benefits of this Act, the business community has expressed substantial concerns about its costs. Whereas the out-of-pocket compliance costs are generally considered significant (Solomon and Bryan-Low, 2004), they are likely swamped by the opportunity costs SOX imposed on business. Executives complain that complying with the rules diverts their attention from doing business (Solomon and Bryan-Low, 2004). Furthermore, the Act exposes managers and directors to greater litigation risks and stiffer penalties. CEOs allegedly will take less risky actions, consequently changing their business strategies and potentially reducing firm value (Ribstein, 2002).

The overall direct and indirect private costs of SOX on businesses could well outweigh its private benefits. The passage of SOX gives rise to a broader concern that SOX could signal a shift to more rigid federal and state regulation of corporations, thereby causing extensive changes in the economy (Holmstrom and Kaplan, 2003). A 2004 PricewaterhouseCooper's survey of CEOs finds that 59% of the respondents view the risk of overregulation as one of the biggest threats to the growth of firms (Norris, 2004).

Motivated by the ongoing debate on the economic impact of securities regulation, and that of SOX particularly, this paper investigates stock price reactions to the SOX legislative events. A maintained hypothesis is that stock prices unbiasedly incorporate all the expected private costs and benefits of SOX based on available information. As non-U.S.-traded foreign firms are exposed to common global economic news as U.S. firms but are not directly affected by SOX, I examine abnormal returns of the U.S. market around significant SOX legislative events relative to returns of these foreign firms. The cumulative value-weighted (equal-weighted) raw return of the U.S. market amounts to  $-15.35\%$  ( $-12.53\%$ ) around the key SOX events. The differences in value-weighted (equal-weighted) raw returns between U.S. and foreign markets range from  $-1.80\%$  to  $-7.72\%$

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<sup>1</sup>See President Bush's speech at the signing ceremony of SOX (<http://www.whitehouse.gov/news/releases/2002/07>).

(−5.51% to −9.32%) and are not always statistically significant. However, after taking into account different markets exhibiting different response to common economic news in computing U.S. expected returns, the estimated U.S. cumulative abnormal returns around key SOX events range from −3.76% to −8.21% under alternative specifications and are all statistically significant. Further, consistent with Litvak (2005), I find that SOX-complying foreign firms on average experience a negative cumulative abnormal return around key SOX rulemaking events. The results suggest that SOX imposes statistically significant net costs on complying firms. The losses likely reflect the private costs of SOX and/or the expected costs of future federal and state regulation. The cumulative abnormal returns of the U.S. market around all SOX events are not statistically significant. While this finding does not support SOX being costly, it is likely due to the inclusion of insignificant events reducing the power of the test.

Next, I explore the sources of private costs of SOX by investigating its major provisions and their cross-sectional implications. Specifically, I examine the implications of the restriction of non-audit services, the provisions on corporate responsibilities, the provisions on the forfeiture of incentive pay and insider trading, and Section 404 on internal control tests. Greenstone et al. (2006) conjectured that firms in less compliance with new regulatory requirements likely have greater unresolved agency problems and thus benefit more from the regulations. On the other hand, these targeted firms also incur greater costs as a result of rule changes. If the examined SOX provisions impose net private costs on firms, I expect firms that purchased more non-audit services, maintained weaker governance in terms of shareholder rights than optimal, and relied excessively on incentive pay, and those with more complex business experience more negative abnormal returns.

The empirical results largely reject the hypothesis that major SOX provisions entail no net costs. Firms' cumulative abnormal returns around the significant legislative events decrease with their purchase of non-audit services. Firms with foreign operations or international transactions incur significantly greater costs. Moreover, firms with so-called "weak" shareholder rights relative to their industry peers experienced more negative abnormal returns in the SOX rulemaking period. There is some evidence that firms with more business lines or more incentive pay incur greater compliance costs, but the statistical significance of the result is sensitive to specifications. Overall, the cross-sectional tests are consistent with my event study findings that the market expected SOX to impose statistically significant net private costs on firms.

Finally, I examine market reactions to the SECs announcement of deferring compliance with Section 404. I find that small firms that obtained a longer extension period experienced significantly higher abnormal returns than other firms around the announcement. The evidence reveals that investors consider the deferment to be good news and that the compliance costs of Section 404 are statistically significant for small firms.

This study contributes to the research of securities legislation by presenting evidence on the impact of contemporary federal laws that introduce unprecedented substantive changes in firms' operations (Romano, 2004; Bainbridge, 2003). The market reaction analysis provides evidence on the new rules, as a package, imposing net private costs on businesses and investors considering the message conveyed by the legislative activities to be negative.

Further, the cross-sectional analysis attempts to explore the consequences of specific SOX provisions and documents associations between firm characteristics and returns that are consistent with certain provisions being costly. Yet, the analysis cannot fully unravel the consequences of specific SOX provisions. SOX provisions are correlated, so are the

examined firm characteristics. One cannot definitively attribute the costs of SOX to a subset of provisions.

This paper also extends the event-study literature by examining changes in stock prices in response to market-wide news. Investigating the impact of market-wide news is more challenging than typical event studies that investigate market reactions to news releases affecting a subset of listed firms. This paper uses foreign returns as a benchmark to evaluate normal market-level returns in the U.S. and examines the impact of other contemporaneous news announcements in the SOX rulemaking period through intraday return tests.<sup>2</sup>

This study does not explore the social welfare implication of the Act. An investigation of changes in security prices provides evidence for the private benefits and costs of regulations, but social benefits and costs may not be fully reflected in stock prices (Gonedes and Dopuch, 1974; Watts and Zimmerman, 1986). In addition, this paper is subject to the fundamental limitations of event studies (Leftwich, 1981; Schwert, 1981). First, other contemporaneous news is incorporated in stock prices and cannot be disentangled definitively from the impact of SOX. The finding that foreign firms not subject to SOX also experienced negative returns in the SOX rulemaking period, albeit smaller in magnitude, suggests that other contemporaneous worldwide economic news negatively affected U.S. firms. Second, as investors' expectations are unobservable, I cannot reject the alternative hypothesis that investors had expected stronger rules and were disappointed by SOX. Third, it is possible that the market over-estimated the net costs of SOX when it was passed and subsequently SOX turned out to be less costly than expected. Future research on these issues would provide additional insight for the evaluation of the Act.

The remainder of the paper is organized as follows. Section 2 discusses the event history of SOX and related research. Section 3 examines the private costs and benefits of the Act and develops hypotheses regarding the cross-sectional variation in market response to the Act. Empirical tests of these hypotheses are then discussed in Section 4. Section 5 concludes.

## 2. Related research and SOX event history

### 2.1. Related research

The existing research on securities regulations is inconclusive on the consequences of mandatory disclosure laws. Early studies by Stigler (1964) and Benston (1973) find no evidence of changes in returns or the variability of returns after the Securities Acts of 1933 and 1934. They argue that mandatory disclosures imposed by the Securities Acts generated few benefits and considerable costs. However, the methodology and the interpretation of these studies have been challenged subsequently (Schwert, 1981; Friend and Westerfield, 1975). Chow (1983) improves on this line of research by examining market reactions to the rulemaking progress of the 1933 Securities Act. He finds stock price declines for complying firms in the rulemaking period and concludes that the Act was costly. Coffee (1984) calls for research on more contemporary securities regulations and points out that the benefits of mandatory disclosures may not be reflected in stock returns.

More recently, Bushee and Leuz (2005) document positive externalities as well as significant costs of increased disclosure by investigating the regulation to mandate OTCBB

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<sup>2</sup>I thank the editor and the referee for suggesting the use of foreign returns.

firms to comply with the 1934 disclosure laws. They find that a large portion of firms delisted in response to the regulatory change and the delisting decision was associated with significant reductions in their market value. In contrast, [Greenstone et al. \(2006\)](#) examine the impact of the 1964 Securities Acts Amendments to extend the 1934 disclosure requirements to large firms traded over the counter. They find that the most affected firms experienced a positive abnormal return around the announcement of the law and that they outperformed less affected firms (i.e., those in partial compliance with the disclosure mandates) in the rulemaking period. They argue that mandatory disclosures can benefit shareholders by deterring diversions of profits by insiders.

While the existing literature produces mixed evidence regarding whether mandatory disclosures are beneficial, SOX imposes additional disclosure requirements, and more importantly, it further proposes substantive corporate governance mandates, which is unprecedented in the history of federal securities legislation. [Romano \(2004\)](#) argues that by enacting SOX, Congress substitutes its judgments for that of the board in real corporate activities and that SOX can be a first step in federalizing corporate laws. Thus, this study adds to the literature by investigating the consequences of a contemporary and potentially significant change in federal securities legislation.

Many concurrent studies examine the consequences of the Sarbanes–Oxley Act; however, there is no consensus on how SOX changes business practices, nor whether the changes are value increasing for firms. Regarding the SOX provision to require firms have a financial expert on the board, [DeFond et al. \(2005\)](#) document that firms voluntarily appointing a financial expert to the board prior to SOX experienced positive returns at the announcement of the appointment. Yet, they also find that the impact of such an appointment is contextual and point out it is unclear that requiring all firms to appoint a financial expert is beneficial on average. [Bhattacharya et al. \(2002\)](#) examine the market response to CEO and CFO certification required by SOX. They find no significant price reactions. [Engel et al. \(2006\)](#) examine firms' going private decisions and suggest that some small firms deregister after SOX as a result of the compliance costs imposed by SOX. Investigating firms' going dark decisions, [Leuz et al. \(2006\)](#) find that SOX drives some poor performing firms out of the stock market as insiders are exposed to greater legal liabilities.

Several studies investigate the impact of SOX on U.S.-listed foreign firms that are required to comply with this legislation. [Berger et al. \(2005\)](#) find that foreign private issuers experience more negative returns in the U.S. market than U.S. firms around certain SOX events. They argue that the incremental bonding benefits provided by SOX are exceeded by the costs. [Litvak \(2005\)](#) compares the abnormal returns of U.S.-listed foreign firms with their non-U.S.-traded counterparts around the SOX events. She finds that U.S.-listed foreign firms experienced negative abnormal returns around events that increased the likelihood of SOX passage.

While these studies further the understanding of various aspects of SOX, the average wealth implication of this Act on U.S. firms is not yet explored, which is the focus of this paper. There are two concurrent studies closely related to this paper. Both [Rezaee and Jain \(2002\)](#) and [Li et al. \(2004\)](#) investigate market reactions to SOX rulemaking activities and conclude that SOX is beneficial. Appendix A discusses the problems with these two studies. This paper reports conflicting evidence after taking into account the problems. First, I find no evidence supporting the conjecture that SOX is beneficial. Second, I examine major SOX provisions and find that the investigated provisions likely impose net private costs on firms.

## 2.2. Event history

The Sarbanes–Oxley Act, which combined the accounting reform bills of Sen. Sarbanes and Rep. Oxley, was passed in Congress on July 25, 2002. The two bills, together with other legislative proposals towards corporate reforms, were triggered directly by the collapse of Enron in late 2001, which exposed an unprecedented accounting scandal and an allegedly seriously corrupted governance system. I identify the legislative events leading to the passage of SOX by a keyword search of “accounting” through the *Wall Street Journal* (*WSJ* hereafter) and the *Washington Post* (*WP* hereafter) via *Factiva*, from November 2001 to July 2002. To identify related post-SOX rulemaking events, I search the *WSJ* and *WP* for “Sarbanes–Oxley” from August 2002 to December 2003 and examine press releases of the SEC and the PCAOB during this period. The *WSJ* is widely considered the most influential and timely business journal and its news filtering system is likely to extract legislative activities that are most relevant to the business community. The *WP* closely follows significant movements in Congress and provides information supplementary to the *WSJ* articles.

There was no significant development in securities rulemaking in 2001 (Hilzenrath, 2001). The first signal of a regulatory overhaul was reported on January 16, 2002 (Day and Crenshaw, 2002) when SEC Chairman Pitt announced a reform plan to create an independent regulatory organization. Legislative activities progressed slowly from February to May 2002. The Bush Administration unveiled their response to the Enron scandal in February and March, while Congress moved ahead with several proposals towards accounting reforms. Republican Rep. Oxley’s reform bill, considered business-friendly by the media, was introduced in the House on February 13 (Schroeder, 2002a). Meanwhile, Democratic senators reportedly drafted bills that went beyond Oxley’s proposal (Schroeder, 2002b, c).

Although Sen. Sarbanes’ tough reform bill passed in the Senate Banking Committee on June 18, the media did not expect it to become law at that time (Hilzenrath et al., 2002). However, the exposure of the WorldCom scandal in late June boosted securities rulemaking activities (Hamburger et al., 2002). The rulemaking process accelerated after President Bush delivered a speech regarding accounting reforms on July 9 (Cummings, 2002). The Senate started debate on Sarbanes’ bill on July 8 and the bill was passed 97 to 0 in the Senate on July 15 (Hilzenrath et al., 2002).

House GOP leaders allegedly sought to dilute Sarbanes’ bill after its passage (VandeHei, 2002a). However, they soon retreated from such efforts and offered minor changes to complete the legislation (Murray, 2002a). The House and Senate formed a conference committee and started final negotiations to merge the bills on Friday, July 19 (Hilzenrath, 2002). The negotiation continued over the weekend of July 20 and in a radio address on Saturday, July 20, President Bush urged Congress to pass a final bill before the fall recess (Melloan, 2002). The final rule was agreed upon on July 24 (VandeHei and Hilzenrath, 2002), passed in Congress on July 25, and signed into law on July 30 (Hitt, 2002).

The implementation of SOX started soon after its passage and the rulemaking activities continued in 2003. The SEC adopted rules on management report of internal controls on May 27 (Solomon, 2003). The PCAOB audit standard of internal controls was approved by the SEC in June 2004, which completed the major rulemaking activities directed by SOX.

### 3. Hypotheses

#### 3.1. U.S. market reaction to SOX

The Sarbanes–Oxley Act established the Public Company Accounting Oversight Board (PCAOB), prohibited auditors from performing certain non-audit services for their audit clients, and imposed greater criminal penalties for corporate fraud. Further, Section 404 of the Act required that management assess internal controls and that auditors report on their clients' internal controls. The specifics of SOX are discussed in greater detail in the next subsection.

Lawmakers expect SOX to enhance corporate controls of public firms and prevent accounting misrepresentations. Mahoney (1995) points out that mandatory disclosures are a means of controlling agency costs. Greenstone et al. (2006) further argue that as private contracts cannot prevent all expropriations of firm profits by insiders, regulations can increase the expected penalties for expropriation and thereby reduce misbehaviors and increase shareholder value. In other words, if the exposed accounting scandals that led to the rulemaking activities suggest a pervasive market failure, the regulations could increase firm value and improve efficiency. As Watts and Zimmerman (1986) indicate, regulations could improve social welfare in a Pareto sense, if government regulations and enforcement lower the private contracting costs.

However, it is unclear that the government's remedies are always less costly than the private contracting process. SOX rushed through Congress in a very short period of time. Romano (2004) argues that electoral concerns were aided at the cost of a comprehensive consideration of the implications of the legislation. She explains that Democrats planned to charge pro-business Republicans for being soft on corporate scandals in the mid-term election of November 2002, and Republicans responded to show their determination to punish corporate wrongdoings.

The business community and certain academics criticize SOX more specifically. While the out-of-pocket compliance costs are generally considered substantial (Solomon and Bryan-Low, 2004), the indirect opportunity costs imposed by SOX are likely even greater. The *Wall Street Journal* cited the chief accounting officer of General Motors: "The real cost isn't the incremental dollars, it is having people that should be focused on the business focused instead on complying with the details of the rules" (Solomon and Bryan-Low, 2004). Moreover, as SOX increases the litigation risks of management, Ribstein (2002) argues that it could discourage CEOs from value-increasing risky investment. Wallison (2003) expects the change in management's risk-taking behavior to reduce the growth of firms and even deter economic growth. The change in the behavior of lawmakers, especially pro-business Republicans, towards tighter government controls is likely to give rise to rigid federal and state regulation in the future. The change is therefore expected to have long-lasting and far-reaching influence on business practices (Holmstrom and Kaplan, 2003).

If investors consider the Act on net costly and/or the information conveyed by the passage of the Act bad news for business, the cumulative U.S. return around the rulemaking events adjusted for the impact of contemporaneous economic news would be negative.

**H1:** *If SOX imposed net costs on U.S. firms, firms' cumulative returns adjusted for the impact of contemporaneous economic news around the SOX rulemaking events would be negative.*

The market response to individual events was determined by the value implication of the Act and how the news changed investors' expectations of the probability of passing tough rules (Leftwich, 1981). If the proposed regulation imposed net private costs on firms, events that increased the probability of passing tough rules would be associated with significant negative abnormal returns.

### 3.2. Specific provisions of SOX and their cross-sectional implications

This section examines various SOX provisions in four areas, namely, auditor independence, corporate responsibilities, internal controls, and incentive pay and insider trading.

#### 3.2.1. Provisions on non-audit services

SOX prohibits accounting firms from providing eight categories of non-audit services contemporaneously with audit services, thereby leaving tax services as the primary non-audit service available to audit clients (Section 201).<sup>3</sup> The restriction of non-audit services reflects lawmakers' concern that the provision of non-audit services compromises auditor independence by increasing the economic bond between the auditor and the client. However, auditors adamantly opposed this position and argued that performing non-audit services helps them gain competencies and capabilities that are essential to the audit process (Schroeder and Hamburger, 2002).

Empirical evidence on the relation between non-audit services and audit quality is mixed. For example, Frankel et al. (2002) document a positive relation between non-audit fees and their measures of earnings management. In contrast, Ashbaugh et al. (2003) find no systematic evidence to support the claim that non-audit services impair auditor independence. They point out that the results of Frankel et al. (2002) are sensitive to research design choices. Romano (2004) reviews the research on non-audit services and concludes that the majority of studies find no connection between the provision of non-audit services by the auditor and audit quality.

The restriction on non-audit services assumes that it is optimal for a firm not to purchase the restricted non-audit services from its auditor. If indeed firms used non-audit services opportunistically to bribe the auditor, the provision can help correct the misbehavior and increase shareholder value, especially for those clients purchasing more and thus deviating more from the "optimal". As Greenstone et al. (2006) suggest, firms in less compliance with new rules likely face more diversion by insiders and therefore benefit more from regulations. On the other hand, if auditor-provided non-audit services are cost efficient, the restriction would destroy value by eliminating such cost-efficiency. Ribstein (2002) argues that the restriction could block "knowledge spillovers" that give auditors access to valuable information. Auditors will incur greater costs to gain the institutional knowledge that they could have obtained while performing consulting services for their client. New business consultants will also make greater initial investments than the auditor. These

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<sup>3</sup>The prohibited services include: bookkeeping or other services related to the accounting records of the audit client; financial information system design and implementation; appraisal or valuation, fairness opinions, or contribution-in-kind reports; actuarial services; internal audit outsourcing; management functions or human resources; broker or dealer, investment advisor, or investment banking services; legal and expert services unrelated to the audit.



incremental start-up costs will be borne by the client. This argument predicts firms that purchased more non-audit services will lose more as a result of the rule change. If the restriction is costly on net, firms purchasing more non-audit services would experience more negative returns.

**H2:** *If the restriction on auditor's provision of non-audit services imposed net costs on firms, firms purchasing more non-audit services prior to SOX would incur greater costs and experience more negative cumulative abnormal returns around the SOX rulemaking events.*

### 3.2.2. Provisions on corporate accountability and criminal penalties

SOX prohibits firms from arranging executive loans (Section 402), requires CEOs and CFOs to certify annual and quarterly reports to the SEC (Section 302), and raises criminal penalties for corporate fraud and white-collar crimes. The statute of limitations for security lawsuits is extended from three to five years after the misconduct (Section 804). Moreover, SOX directs the U.S. Sentencing Commission to tighten sentencing guidelines for fraud and white-collar crimes (Sections 805, 905, and 1104). Section 305 lowers the standard to bar individuals from serving as an officer or director. Although the latter changes are not very specific, they indicate a change in attitude towards corporate crimes, and can be expected to influence subsequent legislation and enforcement.

These provisions intend to protect shareholders better by improving the accountability of executives and directors, thereby increasing shareholder value. It is implicitly assumed that at least some firms had not established an optimal governance structure and the new laws can tighten shareholder controls and deter management opportunism in these firms. If the provisions are effective, a firm with weak shareholder protection would benefit more than firms with optimum shareholder protection.

However, these provisions also give rise to significant private costs. Some commentators allege that SOX increased the difficulty of finding qualified directors, compensation of directors, and costs of directors' and officers' insurance policies (Francis, 2003). Further, Harris and Raviv (2005) argue that managers' information can be better exploited when they are in control. Tightening shareholder controls would thus impose costs by reducing management's flexibility in decision making. Also, Core et al. (2005) argue that while weak governance inhibits the removal of incompetent managers, it can encourage managers to behave in a less risk-averse manner by shielding them from the consequences of lower-tail outcomes of good projects. This suggests that tightening shareholder controls can result in managers foregoing valuable risky investment projects. Thus, firms with governance weaker than optimum are expected to make greater changes after SOX and incur greater costs. If the costs of SOX outweigh the potential benefits, firms with shareholder control weaker than optimum would exhibit more negative returns in the SOX rulemaking period.

**H3:** *If the governance provisions of SOX imposed net costs on firms, firms with corporate governance structure weaker than optimum would incur more costs and experience more negative cumulative abnormal returns around the SOX rulemaking events.*

### 3.2.3. Provisions on internal controls

SOX directs the SEC to set rules that require management to document and assess the effectiveness of internal controls. It also directs the PCAOB to prescribe rules requiring the auditor to attest to and report on management's assessment (Section 404). Section 404 is considered one of the most significant changes in financial reporting and a major direct cost driver of SOX. The provision could benefit firms by tightening internal controls and

reducing opportunistic behavior, but it is also associated with substantial initial implementation and subsequent continuing costs. A.R.C. Morgan examines the actual Section 404 cost disclosures and finds that the average initial compliance costs range from \$1.56 million for firms with annual sales less than \$250 million to \$10 million for firms with annual sales between \$7 billion and \$10 billion.<sup>4</sup>

The PCAOB auditing rules regarding Section 404 require first the firm and then its auditor to sample each class of transactions and perform a walk-through when evaluating management's assessment of controls. This suggests that firms with more business lines will incur greater compliance costs. Also, firms with foreign operations or transactions will likely incur greater costs, as their transactions are more complicated, and the documentation and evaluation of internal controls are more costly. On the other hand, Ge and McVay (2005) document that firms with complicated business are more likely to report material control weaknesses. If investors expect the complexity of a firm's transactions increases the likelihood of a material weakness, the benefits of Section 404 would increase with the complexity of firms' business. Thus, if the costs of complying with Section 404 outweigh the benefits of discovering and remedying control weaknesses, firms with more business lines or foreign operations would experience more negative returns in the rulemaking period.

**H4:** *If Section 404 imposed net costs on firms, firms with more complex business would incur greater costs and experience more negative cumulative abnormal returns around the SOX rulemaking events.*

The SEC adopted rules regarding management's report on internal controls on May 27, 2003. In the original proposal, firms were required to comply with Section 404 for fiscal years ending on or after September 15, 2003; in the final rule, accelerated filers are required to comply for fiscal years ending on or after June 15, 2004 and non-accelerated filers are required to comply from the fiscal years ending on or after April 15, 2005.<sup>5</sup> Further, as the compliance date was not extended by one full year or two full years, firms with different fiscal year ends obtained different extension periods. If firms' internal controls are weak on average, then postponing the compliance date of Section 404 constitutes bad news to investors. In this case, late adopters would experience lower abnormal returns than early adopters. Alternatively, deferring the compliance date reduces additional costs that would be incurred to meet a tight deadline. In particular, late adopters avoid competing with early adopters for auditing resources to comply with Section 404. Also, early adopters will develop techniques and procedures in their control tests that will be useful for late adopters. Thus, late adopters would incur lower compliance costs and experience higher abnormal returns around this announcement, if the cost savings from postponing Section 404 are significant.

**H5:** *If the deferment of Section 404 compliance was beneficial, firms that obtained a longer extension period would experience more positive abnormal returns than firms that were required to comply with Section 404 earlier around the announcement of postponing the compliance dates.*

<sup>4</sup>See A.R.C. Morgan's report on Sarbanes-Oxley implementation costs at [http://www.auditnet.org/articles/Sarbanes-Oxley\\_Implementation\\_Costs.pdf](http://www.auditnet.org/articles/Sarbanes-Oxley_Implementation_Costs.pdf).

<sup>5</sup>A firm is considered an "accelerated filer" if: its common equity public float was \$75 million or more as of the last business day of its most recent second fiscal quarter; the firm has been subject to the requirements of Section 13(a) or 15(d) of the Exchange Act for at least 12 calendar months; the firm has previously filed at least one annual report pursuant to the Exchange Act; and, the firm is not eligible to use Forms 10-KSB and 10-QSB.

### 3.2.4. Provisions on incentive pay and insider trading

If there is an accounting restatement as a result of material misconduct, SOX requires CEOs and CFOs to reimburse any incentive-based compensation or profits from the sale of stock received in the 12 months after the misreporting (Section 304). Additionally, executives are prohibited from selling company stock during pension blackout periods and are required to file a more timely disclosure of sales or purchases of company stock (Section 306).<sup>6</sup>

There has been a general concern that stock option grants and other incentive-based compensation provide managers with incentives to manipulate accounting numbers and eventually stock prices in order to maximize their personal wealth (e.g., Kristof and Flanigan, 2002). The new rule on incentive pay and insider trading thus aims to reduce such incentives and deter misreporting. If the provisions are effective, firms that used incentive-based compensation excessively would benefit.

However, these provisions could impose private costs on firms. Incentive-based compensation is designed to align managers' interest with that of shareholders and reward managers based on their performance. Reducing incentive pay in the compensation package would weaken the motivation of managers. Holmstrom and Kaplan (2003) also argue that the disgorgement provision increases the risk to CEOs or CFOs of selling a large amount of stock or options, as "misconduct" is not clearly defined. Putting the incentive pay at stake can cause CEOs to act more conservatively than shareholders would prefer (Ribstein, 2002). Consistent with this view, Cohen et al. (2004b) document a significant decline in both the ratio of incentive compensation to salary and the outlays in R&D and capital expenditures after SOX. These arguments suggest that firms compensating their CEOs with incentive pay excessively would incur more adjustment costs as a result of the rule change. If the net effect of the change is negative, these firms would experience more negative abnormal returns in the SOX event period.

**H6:** *If the provisions on incentive pay and insider trading imposed net costs on firms, firms that use incentive-based compensation excessively would incur greater costs and experience more negative cumulative abnormal returns around the SOX rulemaking events.*

## 4. Empirical tests and results

This section discusses empirical tests of the implications of SOX. First, I examine the overall U.S. market reaction to events leading up to SOX passage. Returns of major foreign markets are used to evaluate abnormal U.S. returns in the rulemaking period. Contemporaneous confounding events are also investigated in detail. Second, cross-sectional regressions are estimated to test H2–H6. Third, I examine market reactions to related SOX rulemaking events after its passage and discuss alternative explanations and sensitivity analyses.

### 4.1. Overall U.S. market reaction to the legislative events leading to SOX

#### 4.1.1. Research design

Since SOX provisions affect every listed U.S. firm, I investigate changes of the U.S. market index around the legislative events. However, changes of the U.S. market index

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<sup>6</sup>Pension blackout period is defined in Section 306 (a) (4) of the Act as any period during which the majority of plan beneficiaries are prohibited from trading on any equity of the firm held in the plans.

capture not only the impact of SOX events but other contemporary economic news as well. It is thus necessary to control for normal U.S. market returns absent the impact of SOX.

I use foreign firm returns in the SOX rulemaking period to evaluate the impact of other news on the U.S. market in that period.<sup>7</sup> Extant finance research suggests that U.S. and foreign firms are exposed to substantial common economic news (e.g., Eun and Shim, 1989; Hamao et al., 1990). Meanwhile, foreign firms, except for those listed on U.S. exchanges, do not comply with SOX.<sup>8</sup> Returns of non-U.S.-traded foreign firms in the SOX period thus reflected the impact of other economic news common to the U.S. and foreign markets but were not directly affected by SOX.

I examine stock returns of the U.S. and 22 major developed foreign stock markets during the SOX rulemaking period. U.S. return data are obtained from CRSP and foreign stock price data are from Datastream. Stocks with a price of less than one unit of local currency at the beginning of each year are deleted to avoid the small price effect (Blume and Stambough, 1983).

U.S.-exchange-listed foreign firms are excluded in computing the foreign returns, as they are required to comply with SOX. The cross-listing information is obtained from the Bank of New York Depositary Receipt Directory and cross-checked with data obtained from the NYSE, AMEX, and Nasdaq. U.S.-traded foreign firms that do not comply with SOX are also excluded. Numerous foreign firms have started with pink sheets trading (Level I ADR) and then upgraded to exchange listing (Level II or Level III ADR, see the Bank of New York's overview of ADRs). Thus, if SOX is costly, the expected costs of the option to cross-list would increase and non-complying U.S.-traded foreign firms, which are more likely to exercise the option than non-U.S.-traded firms, would be negatively affected.<sup>9</sup> The list of Level I ADRs is also obtained from the Bank of New York Depositary Receipt Directory. The National Quotation Bureau's pink sheets are used to identify Canadian firms traded by pink sheets. Table 1 Panel A reports the distribution of non-U.S.-traded foreign sample by country. Japan and the U.K. have the largest representation in the sample.

The comparison of returns across countries is complicated by time zone differences. The morning trading of day  $t$  in the U.S. overlaps the late afternoon trading in most European countries for one and a half hours, while the U.S. market opens on day  $t$  U.S. time after the Asian markets close on day  $t$  local time. As a result of the trading hour differences and complicated lead-lag structure between U.S. and foreign returns, the following regression is estimated to model the relation between U.S. and foreign returns,

$$US\_Ret_t = a_0 + a_1 CAN\_Ret_t + a_2 EU\_Ret_t + a_3 EU\_Ret_{t+1} + a_4 AS\_Ret_t + a_5 AS\_Ret_{t+1} + e_t. \quad (1a)$$

<sup>7</sup>In a concurrent independent study, Litvak (2005) uses returns of non-U.S.-traded foreign firms to estimate abnormal returns of U.S.-listed foreign firms in the SOX rulemaking period. She finds that U.S.-listed foreign firms experienced significantly negative returns around certain SOX events.

<sup>8</sup>Foreign firms reporting under Section 13(a) or 15(d) of the Exchange Act are required to comply with SOX. See the SEC final rule release, "Certification of Disclosure in Companies' Quarterly and Annual Reports", for an example of how SOX applies to foreign private issuers.

<sup>9</sup>Inclusion of these firms in estimating U.S. normal returns will reduce the estimated cumulative abnormal return by about 0.5%, but the inference does not change.

Table 1  
Relation between returns of U.S. firms and non-U.S.-traded foreign firms

Panel A: Distribution of non-U.S.-traded foreign firms by their home country

	Non-U.S.-traded	
	# Of firms	% Of total
<i>Europe</i>		
Austria	73	0.90
Belgium	139	1.71
Denmark	155	1.91
Finland	114	1.40
France	643	7.90
Germany	805	9.90
Ireland	20	0.25
Italy	196	2.41
Luxembourg	33	0.41
Netherlands	104	1.28
Norway	110	1.35
Portugal	56	0.69
Spain	96	1.18
Sweden	261	3.21
Switzerland	207	2.54
U.K.	953	11.71
<i>North America</i>		
Canada	706	8.68
<i>Asia</i>		
Hong Kong	214	2.63
Japan	2811	34.55
Singapore	58	0.71
<i>Oceania</i>		
Australia	333	4.09
New Zealand	48	0.59
Total	8135	100.00

Panel: B Correlation between returns of U.S. and non-U.S.-traded foreign firms

	$US\_Ret_t$	$CAN\_Ret_t$	$EU\_Ret_t$	$EU\_Ret_{t+1}$	$AS\_Ret_t$
$CAN\_Ret_t$	<b>0.7812</b>				
$EU\_Ret_t$	<b>0.6854</b>	<b>0.6693</b>			
$EU\_Ret_{t+1}$	<b>0.3690</b>	<b>0.2467</b>	<b>0.2858</b>		
$AS\_Ret_t$	<b>0.2466</b>	<b>0.3332</b>	<b>0.3609</b>	-0.0537	
$AS\_Ret_{t+1}$	<b>0.3931</b>	<b>0.2703</b>	<b>0.2645</b>	<b>0.3505</b>	0.1312

Panel: C Regressions of returns of U.S. firms on returns of non-U.S.-traded foreign firms

	Model (1a)		Model (1b)	
	Estimate	<i>t</i> -stat	Estimate	<i>t</i> -stat
<i>Intercept</i>	0.0000	0.07	<i>Intercept</i>	-0.0002
$CAN\_Ret_t$	0.6243	7.17***	$CAN\_Ret_t$	0.8751
$EU\_Ret_t$	0.2773	3.29***		12.39***

Table 1 (continued)

	Model (1a)		Model (1b)	
	Estimate	<i>t</i> -stat	Estimate	<i>t</i> -stat
<i>EU_Ret</i> <sub><i>t</i>+1</sub>	0.1021	1.64		
<i>AS_Ret</i> <sub><i>t</i></sub>	−0.0529	−0.74		
<i>AS_Ret</i> <sub><i>t</i>+1</sub>	0.1650	2.30**		
Adj. <i>R</i> <sup>2</sup>	68.18%		60.63%	

This table reports the distribution of non-U.S.-traded foreign firms by their home country, the correlation between U.S. and foreign returns in the estimation period, and the estimation results of models (1a) and (1b) on the relation between U.S. and foreign returns.

Panel A reports the distribution of non-U.S.-traded foreign firms by their home country. The U.S.-listed or U.S.-traded foreign firms and firms with a price of less than one unit of local currency are excluded. The U.S.-listing information is obtained from the Bank of New York Depositary Receipt Directory and cross-checked with data obtained from the NYSE, AMEX, and Nasdaq. Non-Canadian firms are classified based on their cross-listing status as of the end of 2002. The National Quotation Bureau's pink sheets are used to identify Canadian firms traded over the counter by pink sheets. The classification of Canadian firms is based on their status as of January 2006.

Panel B reports the correlation between value-weighted U.S. and foreign returns in the estimation period. *US\_Ret*<sub>*t*</sub> represents the value-weighted raw return of the U.S. portfolio on day *t* U.S. time. *CAN\_Ret*<sub>*t*</sub>, *EU\_Ret*<sub>*t*</sub>, and *AS\_Ret*<sub>*t*</sub> denote value-weighted returns of non-U.S.-traded firms in Canada, Europe, Asia (including Australia and New Zealand) on day *t* local time. The market capitalization of each stock in U.S. dollars on day *t* − 1 is used to compute the weight of returns of day *t*. Correlation coefficients that are significantly different from zero at less than 5% level are presented in bold.

Panel C presents the estimation results of the following regressions.

$$US\_Ret_t = a_0 + a_1 CAN\_Ret_t + a_2 EU\_Ret_t + a_3 EU\_Ret_{t+1} + a_4 AS\_Ret_t + a_5 AS\_Ret_{t+1} + e_t, \quad (1a)$$

$$US\_Ret_t = a_0 + a_1 CAN\_Ret_t + e_t. \quad (1b)$$

*US\_Ret*<sub>*t*</sub> represents the value-weighted raw return of the U.S. portfolio on day *t* U.S. time. *CAN\_Ret*<sub>*t*</sub>, *EU\_Ret*<sub>*t*</sub>, and *AS\_Ret*<sub>*t*</sub> denote value-weighted returns of non-U.S.-traded firms in Canada, Europe, Asia (including Australia and New Zealand) on day *t* local time. The market capitalization of each stock in U.S. dollars on day *t* − 1 is used to compute the weight of returns of day *t*. The regressions are estimated using daily return data in the 100 days prior to December 28, 2001 to capture the relation between U.S. returns and returns of non-U.S.-traded foreign firms.

*US\_Ret*<sub>*t*</sub> represents returns of the U.S. market on day *t* U.S. time. *CAN\_Ret*<sub>*t*</sub>, *EU\_Ret*<sub>*t*</sub>, and *AS\_Ret*<sub>*t*</sub> denote returns of non-U.S.-traded firms in Canada, Europe, Asia (including Australia and New Zealand) on day *t* local time.

Table 1 Panel B reports the correlation of value-weighted daily returns of stock markets in different zones in the estimation period. The market capitalization of each stock in U.S. dollars on day *t* − 1 is used to compute the weight of returns of day *t*. The exchange rates are obtained from the Compustat Global Currency file. *CAN\_Ret*<sub>*t*</sub> is most highly correlated with *US\_Ret*<sub>*t*</sub> with a correlation coefficient of 0.7812. Both *EU\_Ret*<sub>*t*</sub> (*AS\_Ret*<sub>*t*</sub>) and *EU\_Ret*<sub>*t*+1</sub> (*AS\_Ret*<sub>*t*+1</sub>) are positively correlated with *US\_Ret*<sub>*t*</sub>, suggesting that it is necessary to include both returns in predicting *US\_Ret*<sub>*t*</sub>. However, as *EU\_Ret*<sub>*t*</sub> (*EU\_Ret*<sub>*t*+1</sub>) reflects news in U.S. returns of day *t* − 1 (*t* + 1) and day *t*, if significant economic news arrives consecutively in the examined event period but not in the estimation period, the estimate of *US\_Ret*<sub>*t*</sub> based on the returns of two consecutive days could be

biased. As an alternative, I also use  $CAN\_Ret_t$  alone, which exhibits the highest correlation with  $US\_Ret_t$ , to estimate normal U.S. returns,

$$US\_Ret_t = b_0 + b_1 CAN\_Ret_t + e_t. \quad (1b)$$

Regressions (1a) and (1b) are estimated using daily return data in the 100 days prior to December 28, 2001.<sup>10</sup> The estimation results based on value-weighted returns are reported in Table 1 Panel C. The adjusted  $R^2$  is 68.18% for regression (1a) and 60.63% for regression (1b). The high  $R^2$ s are consistent with prior findings that national stock markets are highly correlated. The inclusion of the European and Asian market returns moderately improves the explanatory power of the model.

#### 4.1.2. Cumulative market returns in the U.S. over the event period

The parameter estimates in Table 1 Panel C are then used to predict U.S. normal returns absent in the impact of SOX in the SOX event period. The abnormal returns are computed as the prediction errors (e.g.,  $AR_t = US\_Ret_t - (\hat{b}_0 + \hat{b}_1 CAN\_Ret_t)$ ). I first conduct  $t$ -tests based on the standard deviation of prediction errors in the estimation period. As the variability of prediction errors in 2002 can differ from that in the estimation period and returns of consecutive event days can be autocorrelated, I also test the statistical significance of U.S. abnormal returns using the bootstrapping method.<sup>11</sup>

Table 2 reports value-weighted raw and abnormal returns around the legislative events leading to the passage of SOX. No legislative events prior to July 2002, except for event 2, were associated with a significant revision of market's expectations, consistent with what news reports revealed: the probability of passing laws was generally considered remote before July (e.g., Cummings et al., 2002).

The most momentous SOX rulemaking activities occurred in July 2002 and were associated with the most significant market reactions. President Bush's speech on July 9 (event 14) emphasized the importance of government-mandated corporate reforms.<sup>12</sup> Romano (2004) noted that the President unexpectedly proposed tougher rule changes, such as the prohibition of corporate loans to executives, which even Sen. Sarbanes did not include in his bill. His speech was viewed by the media as signaling a change of attitude in Washington and a change in the balance of power between the federal government and corporations (Cummings et al., 2002). Cummings et al. (2002) also argue that President Bush's expressed determination towards reforms significantly increased the likelihood of law passage. Meanwhile, the Senate debated Sen. Sarbanes' bill from July 8–12. Several amendments, such as the amendment to impose tougher penalties for corporate wrongdoings, were passed to add teeth to the bill (Romano, 2004). The abnormal return estimated using models (1a) and (1b) is  $-1.55\%$  and  $-3.10\%$ , respectively. While the

<sup>10</sup>In order to avoid mismatching market reactions, a trading day is excluded if foreign markets open on the prior week-day while the U.S. market closes. For example, the U.S. market stopped trading in the week after the September 11th terrorist attack while other markets continued trading. The impact of the event was reflected in U.S. returns on September 17th, when the stock market resumed trading, while it had been incorporated in stock prices in other countries. Thus, relating the returns on September 17th of U.S. and foreign markets would cause a mismatch.

<sup>11</sup>Following Lo (2003) and Busse and Green (2002), the bootstrapped  $p$ -values are calculated as follows: (1) for each event, returns of the same number of consecutive non-event days in 2002 are computed (sample A); (2) a sample (sample B) of 1000 returns is drawn with replacement from sample A; (3) one-tailed  $p$ -values are computed as:  $p = \frac{\text{number of observations in sample B with values greater (lower) than } R_t/1000}{1000}$ , if  $R_t > 0$  (if  $R_t < 0$ ).

<sup>12</sup>See the content of the speech at <http://www.whitehouse.gov/news/releases/2002/07/20020709-4.html>.







		<i>CVWRET</i> (1)	<i>t</i> -stat	Bootstrap <i>p</i> -value	U.S.-(1)	<i>t</i> -stat	Bootstrap <i>p</i> -value	<i>CEWRET</i> (2)	<i>t</i> -stat	Bootstrap <i>p</i> -value	U.S.-(2)	<i>t</i> -stat	Bootstrap <i>p</i> -value
7/20/2002	Bush pushed to speedup rulemaking in a radio address												
7/23/2002	Lobbyists reportedly lost their impact												
7/24/2002	Senate and House agreed on the final rule												
7/25/2002	Senate and House passed SOX												
17				0.0611	3.00***	0.0270	0.0451	4.03***	0.0100	0.0424	3.33***	0.0100	0.0100
Panel: B Cumulative raw returns around the significant SOX events (events 2, 14, 16, and 17)													
U.S.		-0.1535	-3.49***	0.0000	—	—	—	-0.1253	-3.27***	0.0000	—	—	—
Canada		-0.0791	-2.01**	0.0510	-0.0744	-2.67***	0.0000	-0.0607	-2.41**	0.0020	-0.0645	-2.27**	0.0310
Europe	Cumulated over the same calendar dates as the U.S.	-0.1233	-2.97***	0.0200	-0.0302	-0.89	0.0130	-0.0563	-1.91*	0.2290	-0.0689	-2.48**	0.0000
	Cumulated over the next day after the U.S. dates	-0.1355	-3.02***	0.0030	-0.0180	-0.36	0.0520	-0.0701	-2.25**	0.0980	-0.0551	-1.61	0.0000
Asia	Cumulated over the same calendar dates as the U.S.	-0.0762	-1.97**	0.0010	-0.0772	-1.52	0.0560	-0.0321	-1.37	0.1070	-0.0932	-2.33**	0.0040
	Cumulated over the next day after the U.S. dates	-0.0981	-2.58***	0.0000	-0.0553	-1.22	0.1480	-0.0494	-2.12**	0.0120	-0.0759	-2.14**	0.0190
Panel: C Cumulative raw returns around all SOX events													
U.S.		-0.1596	-1.87*	0.1410	—	—	—	-0.1293	-1.73*	0.2590	—	—	—
Canada		-0.0961	-1.26	0.2980	-0.0634	-1.17	0.2060	-0.0272	-0.55	0.1810	-0.1021	-1.84*	0.5990
Europe	Cumulated over the same calendar dates as the U.S.	-0.1273	-1.58	0.5770	-0.0323	-0.49	0.0570	-0.0758	-1.32	0.7700	-0.0553	-0.99	0.0760
	Cumulated over the next day after the U.S. dates	-0.1329	-1.52	0.4650	-0.0267	-0.27	0.0930	-0.0852	-1.40	0.6860	-0.0440	-0.66	0.1050
Asia	Cumulated over the same calendar dates as the U.S.	-0.0656	-0.87	0.0395	-0.0940	-0.95	0.3490	0.0017	0.04	0.3820	-0.1310	-1.69*	0.2160
	Cumulated over the next day after the U.S. dates	0.0128	0.17	0.2480	-0.1724	-1.95*	0.0620	0.0099	0.22	0.3090	-0.1391	-2.02**	0.1670
Panel: D Cumulative abnormal returns													
	Cumulated over significant SOX events	<i>CARI</i>		-0.0446	-1.85*	0.0010	0.0010		-0.0376		-1.69*	0.0120	
		<i>CAR2</i>		-0.0821	-2.99***	0.0000	0.0000		-0.0528		-1.85*	0.0350	

Table 2 (continued)

	Value-weighted	<i>t</i> -stat	Bootstrap <i>p</i> -value	Equal-weighted	<i>t</i> -stat	Bootstrap <i>p</i> -value
Cumulated over all SOX events						
<i>CAR1</i>	-0.0589	-1.25	0.0800	-0.0455	-1.05	0.1610
<i>CAR2</i>	<b>-0.0674</b>	-1.26	0.1930	-0.0613	-1.11	0.6120

This table reports the raw and abnormal returns in the U.S. around legislative events leading to the passage of SOX. For each event, the event window is determined using the following procedure: (1) For events related to speeches, if a news report that covered major contents of the speech appeared in the *WSJ* or *WP* on or before the date the speech was delivered, the event window covers one day before the news report to one day after the speech; if a news report appeared in the *WSJ* or *WP* after a speech, the event window covers one day before the speech to one day after the speech. (2) For events related to legislative votes prior to the passage of SOX, as there is some uncertainty about the vote result, the event window covers the voting day and one day after the date. Panel A reports the value-weighted raw and abnormal returns around individual events. *VWRET* represents value-weighted raw returns. Abnormal returns (*ARI* or *AR2*) are computed as the difference between the raw value-weighted U.S. returns and the expected returns computed based on the models (1a) or (1b) in Table 1 Panel C. Panels B to D report value- and equal-weighted raw and abnormal returns cumulated over significant SOX events. *CWRET* represents cumulative value-weighted (equal-weighted) raw returns. Cumulative abnormal returns (*CAR1* or *CAR2*) are computed as the sum of the differences between the raw value- or equal-weighted U.S. returns and the expected value- or equal-weighted returns computed based on the models (1a) or (1b) in Table 1 Panel C. The *t*-statistics are computed using the standard deviation of raw returns or the prediction errors in the estimation period. Bootstrapping one-tailed *p*-values are obtained using the method described in footnote 10.

\*\*\*, \*\*, \* indicate significance at 1%, 5% and 10% levels, respectively, two-tailed tests.

estimated abnormal return is smaller in magnitude than the raw return (−6.42%), showing that there was other news around this event, it is significant except in the *t*-test of the abnormal return of model (1a). The evidence is largely consistent with the hypothesis that these tough amendments were considered costly and/or signaling bad news.

Negative market returns were also observed when House Republicans reportedly gave up efforts to weaken the Senate's tough bill around July 18 (event 16). Studying the congressional records, Romano (2004) argues that Republicans expected to dilute Sarbanes' bill in the conference committee when they allowed the bill to go through the Senate, but their strategy failed in the presence of electoral concerns. The media seemed to share the expectation that Republicans would soften the bill, but found the opposite (see, e.g., Murray, 2002a). The media also revealed concerns that the final bill would impose even greater costs than Sarbanes' proposal. Melloan (2002) commented that the unanimous passage of several proposals in the Senate was scary, as it signaled that most of the members did not care much about the contents of the bill. Hilzenrath et al. (2002) cite the comments of Sen. Gramm after the passage of SOX, "this bill could have been a lot worse," as "virtually anything could have passed the Congress." The estimated abnormal return (−4.94% and −6.38%, respectively, under models (1a) and (1b)) is highly significant, though smaller in magnitude than the raw return (−12.00%).

Given these concerns prior to the final ruling, the positive return on July 24 (event 17) is not surprising. The estimated abnormal return around event 17 is over 4% under both models, consistent with the explanation that the final announcement eliminated prior concerns for tougher rules. By July 23, the House and Senate negotiators still could not agree on several issues including the authority of the PCAOB, whether to prosecute executives that misstate financial reports without a criminal intent, and the extension of the statute of limitations for securities lawsuits (Murray, 2002b). The final rule increased the SECs control over the PCAOB and dropped the proposal to punish unintentional misstatement, but kept the extension of the statute of litigation limitations proposed by the Senate (Murray and Schroeder 2002). Thus, business lobbyists won part of the game.

To summarize, Table 2 Panel A shows that events 2, 14, 16, and 17 were associated with significant changes in investors' expectations of the likelihood of passing tough rules. The market responded negatively to events that signaled increases in the likelihood of passing tough rules and positively to events revealing that no further costs would be imposed. Tests based on the equal-weighted returns produce similar inferences (untabulated).

Table 2 Panels B–D report the cumulative raw and abnormal returns in the SOX period. For completeness and also to show the robustness of the results, both value- and equal-weighted returns are reported. The equal-weighted abnormal returns are computed in the same way as the value-weighted abnormal returns. The daily raw and abnormal returns are then added up to compute the cumulative returns. As measurement errors in estimating regressions (1a) and (1b) could bias the coefficient estimates and subsequently the estimation of U.S. abnormal returns, I also directly compare the raw cumulative returns of the U.S. with those of the foreign markets.

Table 2 Panel B presents raw returns cumulated over the four significant SOX events and the differences in returns between the U.S. and the foreign portfolios. Cumulative value- and equal-weighted raw returns of the foreign portfolios around the key SOX events are negative and mostly significant, suggesting there was news other than SOX in this period. The differences between foreign and U.S. value-weighted (equal-weighted) cumulative returns range from −1.80% to −7.72% (−5.51% to −9.32%). While the

differences in equal-weighted returns are mostly significant, for value-weighted returns, only the difference between the U.S. and the Canadian portfolio ( $-7.44\%$ ) is statistically significant under alternative testing methods. Foreign portfolios can respond differently to global economic news than the U.S. portfolio. If so, the simple differences between U.S. and foreign returns would be biased estimates of U.S. abnormal returns.<sup>13</sup> Table 2 Panel C reports cumulative raw returns around all SOX events. Most of these cumulative returns are insignificant.

Finally, Panel D reports the cumulative abnormal returns of the U.S. around the key SOX events and around all SOX events. For both value- and equal-weighted returns, the cumulative abnormal returns over the key SOX events are negative and statistically significant.<sup>14</sup> The cumulative abnormal returns computed based on value-weighted returns are  $-4.46\%$  and  $-8.21\%$  using models (1a) and (1b), respectively, and are larger in magnitude than those based on equal-weighted returns ( $-3.76\%$  and  $-5.28\%$ ). Small firms likely incur disproportionately greater direct costs to comply with SOX. This conjecture seems to suggest that estimated abnormal returns based on equal-weighted returns should be larger in magnitude than those using value-weighted returns. However, large firms could be subject to greater litigation and political costs as an indirect result of SOX or future legislation. Thus, it is unclear whether small or large firms experience greater losses in total. The cumulative abnormal returns around all SOX events are not statistically significant, ranging from  $-4.55\%$  to  $-6.74\%$ . This result does not support SOX being costly. Nevertheless, as Panel A shows that many SOX events did not significantly change investors' expectations, the lack of statistical significance is likely due to the inclusion of insignificant event days reducing the power of the test.

Overall, the results in Table 2 show that a large fraction of the negative returns that the U.S. market experienced in the SOX rulemaking period could be due to other negative economic news; yet, the impact of SOX is still likely negative and statistically significant. This is consistent with the hypothesis that investors initially considered the new rule and/or the information it conveyed to be bad news.

It should be noted in interpreting the results in Table 2 that SOX can indirectly affect non-U.S.-traded foreign firms in several ways. First, non-U.S.-traded firms that compete with complying firms could obtain a competitive advantage if SOX imposed costs on complying firms. Thus, the return difference between U.S. firms and non-U.S.-traded foreign firms might overestimate the costs of SOX. However, on the other hand, there exists substantial interdependence in trade and financing activities among firms in different countries (Forbes and Rigobon, 2002). Although non-complying firms are not directly affected by SOX, they likely conduct international transactions, establish subsidiaries in

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<sup>13</sup>I estimate regressions of U.S. daily returns on each of the foreign market daily returns. Untabulated results show that the coefficient on foreign returns is always smaller than one. It is rejected that the coefficient equals one, except in the regression of U.S. returns on Canadian returns. Thus, either non-Canadian portfolios exhibit a different sensitivity to global economic news than the U.S., or, due to local economic news, their returns contain substantial measurement errors that bias the coefficient estimates. In either case, subtracting foreign returns other than Canadian returns from U.S. raw returns potentially understates the abnormal returns of the U.S.

<sup>14</sup>I also modify model (1a) by adding contemporaneous implied volatility computed from prices of options on FTSE 100 or S&P/TSX 60 to control for other information captured by changes in the implied volatility. The inferences remain intact. Furthermore, I add 30 variables capturing U.S. macroeconomic news (see Zhang, 2005 for the list of the variables) and the implied volatility of options on S&P 500. The estimated cumulative abnormal return around key SOX events is also negative and statistically significant ( $-3.69\%$  and  $-6.71\%$  based on value- and equal-weighted returns, respectively).

the U.S., and have the option of listing on U.S. exchanges to seek additional financing. If SOX retards the economic growth of the U.S., these firms' U.S. business would be negatively affected. Also, the costs of SOX would reduce the value of the option to list in the U.S. It is an empirical question whether the benefits of gaining a competitive advantage over SOX-complying firms or the losses resulting from the interdependence are greater for non-complying firms.

Second, securities regulation in other countries is likely influenced by that in the U.S. Since the passage of SOX, a number of countries (e.g., the U.K., see Mayer, Brown, Rowe, & Maw LLP, 2003) have adopted rules following the spirit of SOX. If investors in these countries expect the rulemaking progress in the U.S. to trigger costly regulation in their home country, stock prices in foreign markets are likely to decline as SOX developed in the U.S. and the investigated return differences would underestimate the costs of SOX.

Finally, non-U.S.-traded foreign firms also face news unique to their home country or region. Significant local economic news in foreign markets around the SOX legislative events would add noise to the estimation of the impact of SOX.

#### 4.1.3. Returns of U.S.-exchange-listed foreign firms

If SOX is costly, foreign firms complying with SOX would be adversely affected and experience negative returns in the SOX event period. Berger et al. (2005) examine the incremental impact of SOX on U.S.-listed foreign firms relative to U.S. firms. They find that foreign private issuers experience more negative returns than the U.S. firms around certain SOX events. Their results are consistent with the incremental bonding benefits provided by SOX being exceeded by the costs. Litvak (2005) matches U.S.-listed foreign firms with their non-U.S.-traded counterparts by country, industry, and size to examine the abnormal returns of U.S.-listed foreign firms in their home country around the SOX events. She finds that U.S.-listed foreign firms experienced negative abnormal returns around events that increased the likelihood of SOX passage.

I examine returns of U.S.-listed foreign firms in the U.S. relative to returns of non-U.S.-traded firms in the SOX rulemaking period. Consistent with Berger et al. (2005), I find that the value-weighted cumulative raw return of U.S.-exchange-listed foreign firms in the U.S. amounts to  $-18.46\%$  around the four key events, lower than the cumulative raw return of the U.S. market ( $-15.35\%$ ) and that of foreign markets. I then compute normal returns of U.S.-exchange-listed foreign firms in the U.S., applying a method similar to that used to estimate normal returns of U.S. firms. Specifically, I use data in 2001 and regress each foreign private issuer's daily returns on  $CAN\_Ret_t$ ,  $EU\_Ret_t$  and  $EU\_Ret_{t+1}$ , or  $AS\_Ret_t$  and  $AS\_Ret_{t+1}$ , depending on which region it belongs to. Value-weighted market returns are used since U.S.-listed foreign firms are mostly large firms. Abnormal returns in 2002 are computed as prediction errors. Foreign private issuers on average witnessed a negative abnormal return of  $-9.71\%$  around the four key SOX events and this return is statistically significant (untabulated). This analysis compliments Litvak's (2005) finding that U.S.-listed foreign firms underperform non-U.S.-traded foreign firms in their home country market around certain SOX events, providing additional support for SOX imposing net costs on complying firms.

#### 4.1.4. Confounding events and intraday returns

One of the fundamental limitations of event studies is that the measured abnormal performance could also capture other information released at the same calendar date. This

problem particularly stands out in this paper's setting. The market returns likely incorporate investors' reactions to other legislative activities, accounting scandals, and economic news.

To evaluate the extent to which the abnormal returns documented in Table 2 is affected by confounding events, I search for the above-mentioned market-wide news via *ProQuest* from July 8 to July 31, 2002 for *WSJ* and *WP* news reports with their subjects including "federal legislation" or "federal regulation." To capture news about accounting scandals, I search the *WSJ* for news reports with their subjects including "scandals" or "securities fraud." Zhang (2005) discusses the potential confounding events in this period and their impact in detail. The discussion here focuses on the events that might cause the significant market returns in the SOX event period.

Around event 14, major contemporaneous events include the WorldCom hearing (7/8), the debate on the Homeland Security bill in House committees (7/10, 7/11), and the rulemaking related to tax shelters (7/9, 7/11). The House Financial Services Committee held a hearing of the WorldCom scandal starting at 1 p.m. July 8. Both the ex-CEO and the ex-CFO of WorldCom invoked the Fifth Amendment and refused to answer questions. While it is unclear that new information about the WorldCom scandal was revealed through testimonies, the refusal of WorldCom executives to testify could signal that they were hiding some bad news. However, former Enron CFO and CEO also invoked the Fifth Amendment at Congressional hearings on February 8 and 12, 2002, respectively. Neither the one day nor the three-day window around each day was associated with significant market reactions. The rulemaking progress regarding the Homeland Security bill and tax shelters around event 14 was largely overridden around July 18 (Calmes, 2002; Johnston, 2002). Thus, the impact of these bills on the cumulative return of the period was likely canceled out by the subsequent reversals in rulemaking.

To provide further support for the link between the negative return around event 14 and SOX rulemaking news, I examine the immediate market reaction to the President's speech on July 9. The timing of the speech is obtained from the White House website. The intraday results are reported in Table 3.<sup>15</sup> Stock prices began to decline in the middle of the President's speech. The market return in the last 10 min of the President's speech accounts for 18% of the negative return of the day. As the event window is significantly narrowed, the documented return is less likely to reflect the effect of other contemporaneous news.

Around event 16, WorldCom announced bankruptcy filings on July 21 (Sunday). If the negative return of July 22 was driven by this filing, I expect a significant negative return at

<sup>15</sup>The method to compute and test intraday returns is summarized as follows. First, transaction data is obtained from NYSE TAQ database. If a security trades in consecutive intervals,  $t - 1$  and  $t$ , the return during interval  $t$  is estimated as  $R_{it} = (P_{it} - P_{it-1})/P_{it-1}$ , where  $P_{it}$  is the last transaction price in interval  $t$  (Barclay and Litzenberger, 1988). The previous-close-to-open return is calculated using the previous close price, the last transaction price within 10 min before the close of the market, and the open price, the first transaction price within 10 min after the open of the market. The value-weighted market return is calculated as:  $R_t = \sum_{i=1}^N P_{it-1} * Shrou_{it-1} * R_{it} / \sum_{i=1}^N P_{it-1} * Shrou_{it-1}$ , where  $Shrou_{it-1}$  denotes the number of shares outstanding of firm  $i$  at day  $t - 1$ . If a security does not trade in consecutive intervals, the observation is excluded. Second, as intraday returns are not normally distributed (Busse and Green, 2002), I use non-parametric bootstrapping tests to determine the statistical significance of intraday returns. Specifically, to test whether  $R_t$  differs from zero, I employ the following algorithm: (1) returns of the same time interval of non-event days in 2001 and 2002 are computed (sample A); (2) a sample (sample B) of 1000 returns is drawn with replacement from sample A; (3) one-tailed  $p$ -values are computed as:  $p = \text{the number of observations in sample B with values greater (lower) than } R_t / 1000$ , if  $R_t > = 0$  (if  $R_t < 0$ ).

Table 3  
Other contemporaneous events between July 8 and July 31, 2002 and intraday returns

Date	Time of event	Event	Return interval	Return	p-Value	Percentage		
7/9/2002	11:20 a.m.–11:47 a.m.	Bush delivered a speech regarding accounting reforms	11:20–11:29	0.0015	0.0970	–7.22		
			11:30–11:39	–0.0020	0.0370	9.81		
			11:40–11:49	–0.0038	0.0140	18.28		
			11:50–11:59	–0.0007	0.2480	3.16		
			Previous close - close	–0.0207				
7/22/2002	July 21	WorldCom announced intention to file for Chapter 11 on July 21	Previous close - open	–0.0032	0.2490	10.53		
			Previous close - 9:39	–0.0027	0.2950	8.88		
			Previous close - close	–0.0304				
7/24/2002	July 24, 6 a.m.	Adelphia executives were arrested around 6 a.m.	Previous close - open	–0.0190	0.0080	–32.82		
			Previous close - 9:39	–0.0268	0.0060	–46.29		
			Previous close - close	0.0579				
			Previous close - open	0.0207	0.0010	39.01		
7/29/2002	July 26/27	Trade bill passed in the House on July 27 The Homeland Security bill passed in the House on July 26	Previous close - open	0.0234	0.0010	44.10		
			Previous close - 9:39					
			11:00 a.m.–11:31 a.m.	Bush delivered a speech regarding the welfare reform, in which he explicitly indicated that he would sign the accounting reform bill into law	11:00–11:09	–0.0005	0.3580	–1.01
			11:10–11:19	–0.0009	0.2340	–1.64		
			11:20–11:29	–0.0010	0.1780	–1.91		
			11:30–11:39	0.0026	0.0380	4.94		
			Previous close - close	0.0531				

This table reports the intraday returns around certain contemporaneous news announcements between July 8 and July 31, 2002. The method to compute and test the intraday returns is discussed in footnote 14. The last column of the table, percentage, reports the market return in the interval as a percentage of the previous-close-to-close return of the day.

the opening of the market on that day. The previous-close-to-open return of July 22 was  $-0.32\%$ , but it was not statistically significant. Moreover, the negative return reversed within 15 min after the opening of the market (untabulated). The evidence shows that the bankruptcy of WorldCom is unlikely the key driver of the large negative return of the day.

The major contemporaneous event around event 17 is the arrest of Adelphia executives around 6 a.m. of July 24 (Markon and Frank, 2002). The conference committee reached an agreement in the morning and the content of the conference report was revealed during the



day, though the exact timing is not available.<sup>16</sup> If positive stock returns on July 24 mainly reflect the effect of the arrest of Adelphia executives, I expect a significant positive return at the opening of the market. However, the opening return of July 24 was negative, inconsistent with this hypothesis. The negative opening return can be explained by the arrest signaling a change of attitude of the government and an increase in the likelihood that a tough rule would pass.

I also examine quarterly earnings news in July 2002, as earnings releases could also provide information regarding business conditions and move stock prices. Quarterly earnings and earnings announcement dates are obtained from Compustat-CRSP merged quarterly file. Analyst forecast data and actual earnings used to compute forecast errors are from I/B/E/S.

First, three measures are used alternatively to classify an earnings announcement as good news or bad news: earnings, unexpected earnings, or analyst forecast error.<sup>17</sup> Non-negative values are considered good news. Second, I compute the net number of earnings announcements with non-negative earnings ( $Net\_NI$ ), unexpected earnings ( $Net\_UE$ ), or forecast error ( $Net\_FE$ ) for each calendar day, deflated by the number of earnings announcements of the day.<sup>18</sup> If bad earnings news drives the negative return in July 2002, I expect  $Net\_NI$ ,  $Net\_UE$ , and  $Net\_FE$  to be negative in this period and more negative than the rest of the year. Third, as the impact of earnings news on the market index conceivably varies with firm size, I also examine the value-weighted net number of non-negative earnings releases ( $VW\_Net\_NI$ ,  $VW\_Net\_UE$ , and  $VW\_Net\_FE$ ). The weight is calculated as the market capitalization of the announcing firm over the total market value as of the day prior to the earnings release.

The plots of the time-series distribution of  $Net\_NI$ ,  $Net\_UE$ ,  $Net\_FE$ ,  $VW\_Net\_NI$ ,  $VW\_Net\_UE$ , and  $VW\_Net\_FE$  can be found in Zhang (2005). There is no evidence that bad news about earnings clustered in July 2002. On the contrary, the most significant SOX rulemaking period witnessed more good earnings news relative to the rest of the year. Binomial tests reject the hypothesis that the percentage of non-negative news is no greater than 50%, except for July 8, 9, and 26, where it cannot be rejected that good and bad earnings news each account for 50% of the earnings announcements.

In summary, although there were other rulemaking activities, accounting scandals, and earnings news reported from July 8 to July 26, 2002, it is not obvious that they convey significant bad news to the market. Furthermore, the economic recession in 2002 and the news announcements regarding accounting scandals are not totally independent of SOX. The scandals could have caused anti-business rulemaking, the immediate consequence of

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<sup>16</sup>I could search Dow Jones Newswire and find the stamped time of the first news report to test the intraday market reactions. However, I find the stamped time of reports is inaccurate. For example, the President gave a speech on July 29 at 11:00 a.m. However, I find a report stamped at 10:07 a.m., discussing the speech as if it had been given. It is hard to use the inaccurate time to distinguish the impact of confounding events that occur on the same day.

<sup>17</sup>Unexpected earnings are calculated based on the seasonal random walk model. Analyst forecast error is computed as the difference between actual earnings and the consensus forecast, where the consensus forecast is the average of analyst forecasts issued within 60 days prior to the earnings release.

<sup>18</sup> $Net\_NI$  ( $Net\_UE$ ,  $Net\_FE$ ) = the number of announcements with non-negative earnings (unexpected earnings, forecast error) – the number of announcements with negative earnings (unexpected earnings, forecast error).

which was SOX. It is likely that future adverse federal and state regulations were also forecasted by the market which further weakened the economy and deepened the recession.

I also search for significant news announcements around event 2. On the same day as the Treasury Secretary's talk (February 2, 2002, Saturday), the Powers report was released, suggesting that Andersen did not function as an effective check on the disclosure reported by Enron (Chaney and Philipich, 2002). There would have been a negative market reaction to the report if it changed investors' expectation of the reliability of financial reporting and audit quality. I cannot distinguish which event gave rise to the negative return on February 4, 2002.

#### 4.2. Cross-sectional variation in abnormal returns around the rule-making events

##### 4.2.1. Research design, sample selection, and descriptive statistics

The regression to test the cross-sectional implications of SOX provisions is specified as follows:

$$\begin{aligned}
 CAR_i = & \sum_j a_{0j} Ind_{ij} + a_1 Nonaudit_i + a_2 Gindex_i + a_3 Busi\_lines_i \\
 & + a_4 Foreign_i + a_5 Incentive_i + a_6 Size_i + a_7 Accr_i + a_8 Shumway_i \\
 & + a_9 Acq_i + a_{10} MTB_i + a_{11} ROA_i + a_{12} Pre\_Ret_i + e_i.
 \end{aligned} \tag{2}$$

$CAR_i$  is the cumulative abnormal return of firm  $i$ . Abnormal returns are estimated using two methods. I first estimate the market model for each firm using their 2001 daily return data and the U.S. market data. Lo (2003) points out that the market model abnormal returns likely underestimate the impact of regulatory events on individual firms, as the whole market is affected by these events. As an alternative, I also estimate the market model replacing U.S. market returns with five variables capturing returns of non-U.S.-traded foreign firms, namely,  $CAN\_Ret_t$ ,  $EU\_Ret_t$ ,  $EU\_Ret_{t+1}$ ,  $AS\_Ret_t$ , and  $AS\_Ret_{t+1}$ . Cumulative abnormal returns are then computed as the sum of the prediction errors.<sup>19</sup>

H2 examines the impact of the restriction of non-audit services. I collect the non-audit fee data from firms' fiscal 2001 proxy statements via *Lexis/Nexis*. The variable *Nonaudit* is constructed to capture a firm's purchase of non-audit services from the auditor. It equals a firm's non-audit fees minus fees paid to the auditor for tax-related services, deflated by the market value of equity of the firm at the end of 2001. Fees paid to the auditor for tax-related services are excluded because they are not subject to the restriction of non-audit services and they constitute a substantial portion of non-audit fees paid to the auditor.<sup>20</sup> H2 predicts  $a_1$  to be negative.

Bebchuk et al.'s (2005) governance index is employed to capture shareholder protection. Bebchuk et al.'s index improves on Gompers et al. (2001), who construct a governance

<sup>19</sup>Instead of computing  $CAR_i$  as the simple sum of  $AR_{it}$ , I also compute the compounded  $CAR_i$  as  $\exp(\sum_t \ln(1 + AR_{it})) - 1$ . The inferences of the cross-sectional tests remain unchanged if the compounded  $CAR_i$  is used as the dependent variable. Also, the inferences are not sensitive to using  $CAR_i$  over all SOX events as the dependent variable.

<sup>20</sup>Neither Sen. Sarbanes' bill nor the final act banned tax-related services. About 45% of the firms in my sample separately disclosed the amount of fees for tax-related services. For firms that did not disclose the detailed fee items, I use the total non-audit fees in the tests. Investors could not determine whether the services would be affected by SOX if detailed fee items were not disclosed. As a result, it is reasonable to use the total fees for these firms.

index from corporate charters to capture firms' differential shareholder rights. [Bebchuk et al. \(2005\)](#) argue that not all the provisions included in Gompers et al.'s index are related to governance. [Bebchuk et al.](#) consider the following six provisions to be most relevant to shareholder protection: staggered board, limits to shareholder bylaw amendments, supermajority requirements for mergers and charter amendments, poison pills, and golden parachutes.<sup>21</sup> Firms get one point for the existence of each provision. The higher the value of the index, presumably the weaker are shareholder rights.

The analysis in Section 3.2.2 predicts that firms with weak governance would obtain more benefits and incur greater costs as a result of the governance provisions. Ideally, the optimal level of shareholder control for each firm should be used as the benchmark to define weak governance. However, the literature has yet to produce a well specified expectation model of the optimal level of corporate governance. It is also not obvious what is the optimum considered by regulators. As a result, the industry median level of shareholder protection is used as a parsimonious proxy for the optimum. *Bindex* thus equals [Bebchuk et al.](#)'s index less the median of the index in each two-digit SIC industry.<sup>22</sup> H3 predicts that  $a_2$  is negative.

The complexity of business is measured by the number of four-digit SIC industries of each firm (*Busi\_lines*) and a dummy variable to capture whether a firm is involved in transactions with foreign parties or has foreign operations (*Foreign*). *Foreign* equals one if foreign currency adjustment is non-zero, and zero otherwise. H4 predicts  $a_3$  and  $a_4$  to be negative.

H6 predicts that firms that compensate CEOs with excessive incentive-based pay incur larger costs as a result of SOX. Again, the industry median level of incentive-based compensation is used to proxy for the optimum. The variable of interest is thus the ratio of incentive pay, including option grants, restricted stocks, bonus, and long-term incentive payouts, to the total compensation of the CEO, less the industry median ratio (*Incentive*), measured at the end of 2001. Compensation data is obtained from ExecuComp. The variable *Incentive* is likely influenced by firm performance. CEOs in poorly performing firms probably lost their bonus and thus the percentage of incentive pay in their total pay would be low. I control for firm performance by adding return on assets (*ROA*) and the market-adjusted returns (*Pre\_Ret*) both for 2001.

SOX increases the litigation costs of firms and executives and thus firms' abnormal returns around the legislative events likely decrease with their litigation risks. The key variables in the cross-sectional regression, such as *Nonaudit*, *Bindex*, and *Incentive* can be correlated with litigation risks. For example, distressed firms are likely to purchase more consulting services to improve business operations. They are also more likely to become the targets of lawsuits.

To mitigate the omitted correlated variables problem, I include proxies for litigation risks in regression (2). [Lys and Watts \(1994\)](#) find that the probability of lawsuit is a function of the likelihood of bankruptcy, the likelihood of being acquired, firms' accruals, and whether a qualified audit opinion is issued. Since only one firm in my sample received a

<sup>21</sup>The governance data are obtained from the IRRC database and are available for every other year. Since the governance structure is likely sticky, I use the data of 2002, assuming that the governance index of 2002 does not differ significantly from that of 2001. The tenor of the results does not change if I use the governance data of 2000.

<sup>22</sup>If there was a massive market failure prior to SOX, the optimal level of governance can exceed the existing industry norms. Therefore, *Bindex* is defined as a continuous variable rather than being truncated at zero.

qualified audit opinion in 2001, I use proxies for the other three factors to control for litigation risks. The variable *Accr* represents abnormal accruals, computed as residuals from the modified Jones model estimated for each two-digit SIC industry. The likelihood of bankruptcy is estimated based on Shumway (2001) (Table 4b). The variable *Acq* equals one if a firm is subsequently acquired and delisted in 2003. These variables are predicted to have a negative correlation with SOX abnormal returns.

*Size* and *MTB* are also included in the regression. *Size* is measured as the logarithm of the market value of equity of each firm at the end of 2001. Market-to-book ratio (*MTB*) is defined as the market value of equity over the book value of equity at the end of 2001. A firm's purchase of non-audit services, compensation structure, and corporate governance are affected by firm size and investment opportunities. Firms with more growth options could lose more investment opportunities as a result of tight controls and higher litigation risks, which predicts a negative relation between *CAR* and growth options. There is no clear prediction as to the relation between *CAR* and *Size*. Although small firms may incur disproportionately greater direct compliance costs, large firms could be subject to greater litigation and political costs as an indirect result of SOX or future legislation. The *Ind<sub>it</sub>*s are industry dummies and are defined as in Frankel et al. (2002) and Ashbaugh et al. (2003).<sup>23</sup>

To be included in the sample for the cross-sectional test, I require that firms have return data from CRSP, financial data from Compustat, compensation data from Execucomp, governance data from IRRC, and non-audit fee data from proxy statements. Execucomp and the IRRC database largely cover S&P 1500 firms. The final sample includes 1224 observations. The extreme 1% of each continuous variable is winsorized.

Table 4 Panel A shows the sample selection procedures. Although the number of firms only accounts for about 20% of the CRSP population, the market value of these firms constitutes over 90% of the total market capitalization of NYSE, AMEX, and Nasdaq. Small firms are under-represented in this sample. As a result, the test of the differential impact of SOX on small and large firms may lack power. Unreported results show that the pattern and magnitude of average raw returns of the sample around the SOX legislative events are comparable to that of the whole market presented in Table 2. Table 4 Panel B presents firm characteristic variables. The average firm size in the sample is significantly larger than an average firm in the CRSP universe. Panel C reports the Pearson correlation between variables. *Nonaudit* and *Shumway* are positively correlated, consistent with distressed firms using more consulting services. As expected, *Incentive* is positively correlated with *ROA*. *ROA* is highly correlated with *Shumway* (−0.7691), suggesting a multicollinearity problem in the regression. Excluding *ROA* or *Shumway* from the regression does not affect the main results.

#### 4.2.2. Regression results

The estimation results of regression (2) are reported in Table 5. As the event dates are clustered, cross-sectional correlation of returns may result in biased standard errors and potentially incorrect inferences (Sefcik and Thompson, 1986; Bernard, 1987). Moreover,

<sup>23</sup>Industry membership is determined by SIC code as follows: agriculture (0100–0999), mining and construction (1000–1999, excluding 1300–1399), food (2000–2111), textiles and printing (2200–2799), chemicals (2800–2824, 2840–2899), pharmaceuticals (2830–2836), extractive (1300–1399, 2900–2999), durable manufacturers (3000–3999, excluding 3570–3579 and 3670–3679), transportation (4000–4899), utilities (4900–4999), retail (5000–5999), services (7000–8999, excluding 7370–7379), and computers (3570–3579, 3670–3679, 7370–7379).

Table 4  
Descriptive statistics of the sample used in the cross-sectional tests

Panel: A Sample selection procedures											
Sample selection procedures											
Number of firms with return data from CRSP in 2002						7033					
With financial data from Compustat						4844					
With compensation data from Execucomp in 2001						1374					
With governance index from IRRC in 2002						1241					
With non-audit fee data for 2001						1224					
Panel: B Descriptive statistics											
Variable	Number of observations	Mean	Median	Std	<i>p</i> <sub>25</sub>	<i>p</i> <sub>75</sub>					
<i>Nonaudit</i> (%)	1224	0.0946	0.0372	0.1754	0.0114	0.0957					
<i>Bindex</i>	1224	0.0976	0	1.0832	−1	1					
<i>Busi_lines</i>	1224	3.0547	2	1.8142	2	4					
<i>Foreign</i>	1224	0.2974	0	0.4573	0	1					
<i>Incentive</i>	1224	−0.0776	0	0.2784	−0.2069	0.1196					
<i>Accr</i>	1224	0.0497	0.0385	0.1799	−0.0217	0.1213					
<i>Shumway</i>	1224	0.0303	0.0057	0.1295	0.0020	0.0128					
<i>Acq</i>	1224	0.0229	0.0000	0.1496	0	0					
<i>MTB</i>	1224	3.1601	2.2243	3.0214	1.4275	3.8359					
<i>Size</i>	1224	7.2886	7.1345	1.5854	6.2391	8.3002					
<i>Pre_Ret</i>	1224	−0.2127	−0.3050	0.6797	−0.5283	−0.0241					
<i>ROA</i> (%)	1224	0.6819	3.4706	16.1072	−1.0523	7.2661					
Panel: C Pearson correlation											
	<i>Nonaudit</i>	<i>Bindex</i>	<i>Busi_lines</i>	<i>Foreign</i>	<i>Incentive</i>	<i>Accr</i>	<i>Shumway</i>	<i>Acq</i>	<i>MTB</i>	<i>Size</i>	<i>Pre_Ret</i>
<i>Nonaudit</i>											
<i>Bindex</i>	0.0212										
<i>Busi_Lines</i>	0.0527	0.0093									
<i>Foreign</i>	0.0244	0.0156	−0.0019								
<i>Incentive</i>	<b>−0.1280</b>	0.0233	<b>0.0902</b>	0.0368							
<i>Accr</i>	−0.0406	0.0438	0.0467	0.0412	−0.0183						
<i>Shumway</i>	<b>0.1601</b>	−0.0485	<b>−0.0807</b>	0.0028	<b>−0.0797</b>	<b>−0.2915</b>					
<i>Acq</i>	0.0339	0.0165	−0.0137	−0.0278	−0.0429	−0.0168	−0.0107				
<i>MTB</i>	<b>−0.2121</b>	−0.0057	<b>−0.0973</b>	0.0464	<b>0.1554</b>	−0.0075	−0.0260	−0.0383			
<i>Size</i>	<b>−0.3407</b>	−0.0433	<b>0.2196</b>	0.0537	<b>0.3718</b>	0.0097	<b>−0.1433</b>	−0.0500	<b>0.4070</b>		
<i>Pre_Ret</i>	−0.0537	−0.0242	−0.0390	<b>−0.0663</b>	0.0147	0.0092	<b>−0.1505</b>	0.0206	0.0179	<b>−0.0890</b>	
<i>ROA</i>	<b>−0.1910</b>	0.0014	<b>0.0950</b>	−0.0322	<b>0.1162</b>	<b>0.3529</b>	<b>−0.7691</b>	−0.0277	<b>0.1804</b>	<b>0.2522</b>	<b>0.2049</b>

Panel A summarizes the sample selection procedure for the cross-sectional tests. Firms are required to have daily return data from CRSP, financial data from Compustat to compute all variables except for the compensation, non-audit fee, and governance variables, compensation data from Execucomp, governance index from IRRC and non-audit fee data manually collected from proxy statements.

Panel B reports the descriptive statistics of explanatory variables in the cross-sectional tests. *Nonaudit* is calculated as non-audit fees minus fees paid for tax-related services, deflated by the market value of equity of each firm at the end of 2001. *Bindex* is the governance index of Bebchuk et al. (2005) as of 2002 less the median index value in the same two-digit SIC industry. *Busi\_lines* equals the number of four-digit SIC industries of each firm. *Foreign* equals one if foreign currency adjustment is non-zero, zero otherwise. *Incentive* equals the ratio of incentive pay to total compensation of the CEO less the industry median ratio. *Accr* measures abnormal accruals, computed as residuals from the modified Jones model estimated using 2001 data for each two-digit SIC industry. *Shumway* captures the likelihood of bankruptcy, estimated based on Shumway (2001, Table 4b). *Acq* equals one if a firm is subsequently acquired and delisted in 2003. *MTB* denotes the market-to-book ratio, evaluated at the end of 2001. *Size* equals the logarithm of market value of equity at the end of 2001. *Pre\_Ret* is cumulative market-adjusted returns in 2001. *ROA* is return on assets of 2001.

Panel C reports the Pearson correlation between variables used in the cross-sectional tests. Correlation coefficients that are significantly different from zero at less than 5% level are presented in bold.

Table 5  
Cross-sectional test of market reactions to SOX

Panel: A Cross-sectional test of the market reaction to SOX—cumulative returns

	Prediction	Dependent variable							
		CAR (US)				CAR (Foreign)			
		Estimate	p-Value		Estimate	p-Value			
			OLS	Bootstrap		OLS	Bootstrap		
<i>Nonaudit</i>	–	–0.0820	0.0008	0.0440	–0.0652	0.0078	0.0680		
<i>Gindex</i>	–	–0.0066	0.0728	0.0020	–0.0069	0.0641	0.0020		
<i>Busi_lines</i>	–	–0.0046	0.0585	0.0180	0.0015	0.5368	0.2640		
<i>Foreign</i>	–	–0.0223	0.0150	0.0000	–0.0284	0.0021	0.0000		
<i>Incentive</i>	–	–0.0079	0.6057	0.4600	–0.0372	0.0159	0.0000		
<i>Accr</i>	–	–0.0701	0.0036	0.0000	–0.0546	0.0247	0.0120		
<i>Shumway</i>	–	–0.0136	0.7822	0.2310	0.0002	0.9961	0.6960		
<i>Acq</i>	–	0.0434	0.1007	0.0900	0.0319	0.2324	0.2300		
<i>MTB</i>	–	0.0031	0.0464	0.0700	0.0019	0.2156	0.1320		
<i>Size</i>	–	–0.0030	0.3608	0.4000	–0.0051	0.1281	0.3540		
<i>ROA</i>	–	–0.0279	<.0001	0.2620	–0.0106	0.0842	0.8900		
<i>Pre_Ret</i>	–	–0.0011	0.0109	0.0250	–0.0001	0.7791	0.4820		
Adj. R <sup>2</sup>		17.38%				7.23%			

Panel: B Cross-sectional test of the market reaction to SOX—individual events

	Pre-diction	Event 2		Event 14		Event 16		Event 17					
		Estimate	p-Value		Estimate	p-Value		Estimate	p-Value				
			OLS	Boot-strap		OLS	Boot-strap		OLS	Boot-strap	OLS	Boot-strap	
<i>Nonaudit</i>	–	0.0051	0.3913	0.2940	0.0027	0.8241	0.2300	–0.0561	0.0003	0.0260	0.0337	0.0173	0.0580
<i>Bindex</i>	–	–0.0008	0.3559	0.2060	–0.0005	0.8002	0.4600	–0.0058	0.0142	0.0000	–0.0005	0.8302	0.3050
<i>Busi_lines</i>	–	0.0004	0.5468	0.2440	–0.0040	0.0009	0.0060	–0.0041	0.0088	0.0100	–0.0031	0.0293	0.0100
<i>Foreign</i>	–	–0.0021	0.3462	0.2010	–0.0056	0.2148	0.0980	–0.0094	0.1062	0.0000	0.0051	0.3360	0.1160
<i>Incentive</i>	–	–0.0001	0.9769	0.5460	0.0092	0.2203	0.0960	0.0060	0.5351	0.1110	0.0230	0.0096	0.0000
<i>Accr</i>	–	–0.0058	0.3287	0.4180	–0.0423	0.0004	0.0000	–0.0476	0.0020	0.0000	–0.0255	0.0685	0.0340
<i>Shumway</i>	–	–0.0238	0.0478	0.2000	–0.0323	0.1811	0.2040	–0.0139	0.6568	0.3460	–0.0565	0.0480	0.0620
<i>Acq</i>	–	0.0169	0.0091	0.0590	–0.0077	0.5561	0.0980	0.0168	0.3194	0.1780	–0.0173	0.2606	0.1210
<i>MTB</i>	–	0.0001	0.8403	0.5760	0.0003	0.6733	0.4720	0.0013	0.1916	0.1020	–0.0014	0.1212	0.0410
<i>Size</i>	–	–0.0004	0.5900	0.4660	0.0013	0.4210	0.2920	–0.0032	0.1331	0.1980	0.0007	0.7078	0.4660
<i>Pre_Ret</i>	–	–0.0020	0.1745	0.6680	–0.0113	0.0002	0.3720	–0.0206	<.0001	0.0000	–0.0060	0.0910	0.0120
<i>ROA</i>	–	–0.0001	0.2619	0.4340	–0.0013	<.0001	0.0000	–0.0008	0.0045	0.0180	–0.0011	<.0001	0.0000
Adj. R <sup>2</sup>		2.21%		26.13%		32.37%		24.64%					

This table presents the estimation results of regression (2) to examine the cross-sectional variation in market reaction to the key events leading to SOX.

$$\begin{aligned}
 CAR_i = & \sum_j a_{0j} Ind_{ij} + a_1 Nonaudit_i + a_2 Gindex_i + a_3 Busi\_lines_i + a_4 Foreign_i + a_5 Incentive_i \\
 & + a_6 Size_i + a_7 Accr_i + a_8 Shumway_i + a_9 Acq_i + a_{10} MTB_i + a_{11} ROA_i + a_{12} Pre\_Ret_i + e_i \quad (2)
 \end{aligned}$$

*Nonaudit* is calculated as non-audit fees minus fees paid for tax-related services, deflated by the market value of equity of each firm at the end of 2001. *Bindex* is the governance index of [Bebchuk et al. \(2005\)](#) as of 2002 less the median index value in the same two-digit SIC industry. *Busi\_lines* equals the number of four-digit SIC industries of each firm. *Foreign* equals one if foreign currency adjustment is non-zero, zero otherwise. *Incentive* equals the ratio of incentive pay to total compensation of the CEO less the industry median ratio. *Accr* measures abnormal

Table 5 (footnote continued)

accruals, computed as residuals from the modified Jones model estimated using 2001 data for each two-digit SIC industry. *Shumway* captures the likelihood of bankruptcy, estimated based on Shumway (2001, Table 4b). *Acq* equals one if a firm is subsequently acquired and delisted in 2003. *MTB* denotes the market-to-book ratio, evaluated at the end of 2001. *Size* equals the logarithm of market value of equity at the end of 2001. *Pre\_Ret* is cumulative market-adjusted returns in 2001. There are 1224 observations included in each regression. *ROA* is return on assets of 2001.

In Panel A,  $CAR_i$  is the cumulative abnormal return of firm  $i$  over the four key SOX events. Abnormal returns are estimated using two methods. (i) The market model for each firm using their 2001 daily return data and U.S. market data (“US”). (ii) The market model is modified by replacing U.S. market returns with returns of non-U.S.-traded foreign firms, namely, returns of Canada, Europe, and Asia (including Australia and New Zealand) on the same calendar date, and European and Asian returns one day after that day (“Foreign”).

Panel B presents the estimation results of regression (2) with  $CAR \cdot S$  as the dependent variable, where  $CAR$  denotes abnormal returns around the individual events that are associated with revisions in expectations (events 2, 14, 16, and 17), and  $S$  is an indicator variable which equals one for events 2, 14, and 16, and minus one for event 17. The market model based on U.S. market returns is used to estimate  $CAR$ . The coefficients on industry dummies ( $Ind_j$ ) are not reported. For each regression, both the asymptotic two-tailed OLS  $p$ -values and the bootstrapped one-tailed  $p$ -values are reported.

the association between abnormal returns and firm characteristics could be explained by other documented regularities. For example, a negative correlation between abnormal returns and *Bindex* could be driven by the regularities found by Gompers et al. (2003). Therefore, I compute both bootstrapped  $p$ -values and the asymptotic  $p$ -values of the estimated coefficients.<sup>24</sup>

Table 5 Panel A reports the estimation results of regression (2) with U.S. firms’ cumulative abnormal returns around the four key SOX events as the dependent variable.<sup>25</sup> As explained in the previous subsection, cumulative abnormal returns are computed from the market model and the modified market model using foreign returns as the regressors. Both the OLS two-tailed  $p$ -values and bootstrapped one-tailed  $p$ -values show similar inferences.

The coefficient on *Nonaudit* is negative and statistically significant in both regressions, rejecting the hypothesis that the restriction imposes no net costs on firms. Firms’ abnormal returns decrease with *Bindex*, rejecting the hypothesis that the requirements to strengthen shareholder rights impose no net costs on firms. Given that SOX is primarily characterized as an act to protect investors, the result casts doubt on the value of the rules, assuming *Bindex* at least partly captures the extent of shareholder rights. The coefficient on *Busi\_lines* is negative, but not always statistically significant. There is some evidence that firms with more business lines incur greater costs. The coefficient on *Foreign* is significantly negative in both regressions, providing support for H4. The coefficient on *Incentive* is not always significant. Although Cohen et al. (2004b) document a significant decline in the

<sup>24</sup>Based on Lo (2003)’s method, the bootstrapped  $p$ -values are calculated as follows: one-tailed  $p$ -values are the percentage of 1000 repetitions that generate coefficients greater than the OLS coefficients in the table (less than the OLS coefficient if it is negative). Each repetition uses sample firms’ abnormal returns from random non-event days selected from 2002 or 2003. If the event days are consecutive, I select consecutive non-event days similarly. I then add up each firm’s abnormal returns to obtain  $CAR$ .

<sup>25</sup>Using cumulative abnormal returns around all SOX events as the dependent variable does not change the inferences.

ratio of incentive pay to salary after SOX, the return test in this paper does not find strong support for the provisions on incentive pay being costly.

Among the three litigation risk measures, only the coefficient on *Accr* is negative and statistically significant. *Accr* is often used as a proxy for earnings management. Cohen et al. (2004a) suggest that SOX may constrain earnings manipulation. Thus, the negative coefficient on *Accr* can also be interpreted as showing that firms managing earnings prior to SOX incur more net costs. However, it cannot be distinguished whether the litigation or the earnings management explanation is more important.

The coefficient on *MTB* is positive, largely inconsistent with the prediction that firms with more growth options incur greater costs. The coefficient on *Size* is insignificant. The coefficient on *ROA* is negative and significant in one specification. It could be that investors expect firms with higher accounting earnings to have manipulated accounting numbers or that investors expect them to face greater litigation risks.

Table 5 Panel B reports the estimation results of regression (2) with  $CAR^*S$  as the dependent variable, where *CAR* is firms' abnormal returns around the events that revised investors' expectations, and *S* is an indicator variable that equals one for events 2, 14, and 16 (the events with negative market returns) and minus one for event 17 (the event with a positive return).<sup>26</sup> The sign of the coefficients in regression (2) depends on the cross-sectional implications of SOX and the direction in which each event revised investors' expectations. Event 17 was likely associated with a reduction in expected costs of SOX. Consequently, the sign of *CAR* for this event is reversed so that the estimated coefficients have the same signs as predicted by H2–H6. For brevity of presentation, only results of *CAR* estimated using the U.S. market model are presented. The other method based on foreign returns generates very similar results, except that the coefficient on *Busi\_lines* is insignificant in the regression for event 17.

The event-by-event analysis does not always reject the null hypothesis that the examined SOX provisions are not costly. First, not surprisingly, little cross-sectional variation is found for event 2. The Treasury Secretary's talk sent a signal to the market that new regulations were impending, but it was unclear then how laws would be written. Second, in the regression for event 14, only the coefficient on *Busi\_lines* is significant with the expected sign. The coefficients on other variables of interest are insignificant, though those on *Bindex* and *Foreign* have the predicted sign. Third, in the last regression of event 17, again, only the coefficient on *Busi\_lines* is significant with the expected sign. While the coefficient on *Bindex* has the predicted sign, the coefficients on *Nonaudit* and *Incentive* are positive and significant. The positive coefficient on *Nonaudit* is either inconsistent with H2 or reflecting that the market had expected the provisions on non-audit services to be less costly than the final restriction. This latter explanation is plausible as the media reported that accounting firms unexpectedly lost their influence in Congress (Weisman, 2002). The positive coefficient on *Incentive* is inconsistent with H6. Yet, in Panel A, the coefficient on *Incentive* is insignificant.

The lack of consistency in the event-by-event analysis can reflect the tests lacking power. In the regression for event 16, the event with market reaction of the largest magnitude, the coefficients on *Nonaudit*, *Bindex*, *Busi\_lines*, and *Foreign* are all statistically significant with the expected sign. Also, except for *Nonaudit*, the coefficients on *Bindex*,

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<sup>26</sup>I also conduct the event-by-event cross-sectional test using the methodology of Sefcik and Thompson (1986). The inferences remain intact.



*Busi\_lines*, and *Foreign* have the predicted sign in at least three out of the four event-by-event regressions.

In summary, the cross-sectional analysis based on cumulative returns rejects the hypothesis that three major provisions entail no net costs on firms, providing additional support for the hypothesis that the market initially expected SOX to be costly. However, the event-by-event analysis does not consistently support the hypotheses, potentially due to the tests lacking power.

A few issues are worth noting in interpreting the cross-sectional findings. First, the tests document associations between returns and firm characteristics. One cannot rule out the possibility that the coefficient on *Nonaudit*, for example, reflects the impact of other or all provisions rather than just the restriction of non-audit services. Second, certain variables that capture firm attributes are controversial. For example, Cremers and Nair (2005) argue that the governance index based on corporate charters is an anti-takeover protection index, representing external governance.

#### 4.2.3. Market reactions to the announcement of postponing compliance with Section 404

H5 predicts that the postponement of Section 404 announced on May 27, 2003 is good news and therefore late adopters would experience higher abnormal returns than early adopters. The prediction is summarized in Table 6 Panel A. If a firm has a market capitalization of less than \$75 million by the end of 2002, I classify it as a non-accelerated filer. Note that some of the non-accelerated filers could be misclassified as accelerated filers, if their total market value of equity is greater than \$75 million but do not satisfy other criteria for an accelerated filer. I exclude foreign firms and banks, as the expected compliance costs of foreign firms and banks prior to the announcement of the final rule were likely different from those of the other firms.<sup>27</sup>

I employ the following regression to examine market reactions to the announcement:

$$CAR_i = \sum_j a_{0j} Ind_{ij} + a_1 Non\_Acc_i + a_2 Late\_Non_i + a_3 Late\_Acc_i + a_4 MTB_i + a_5 Size_i + e_i, \quad (3)$$

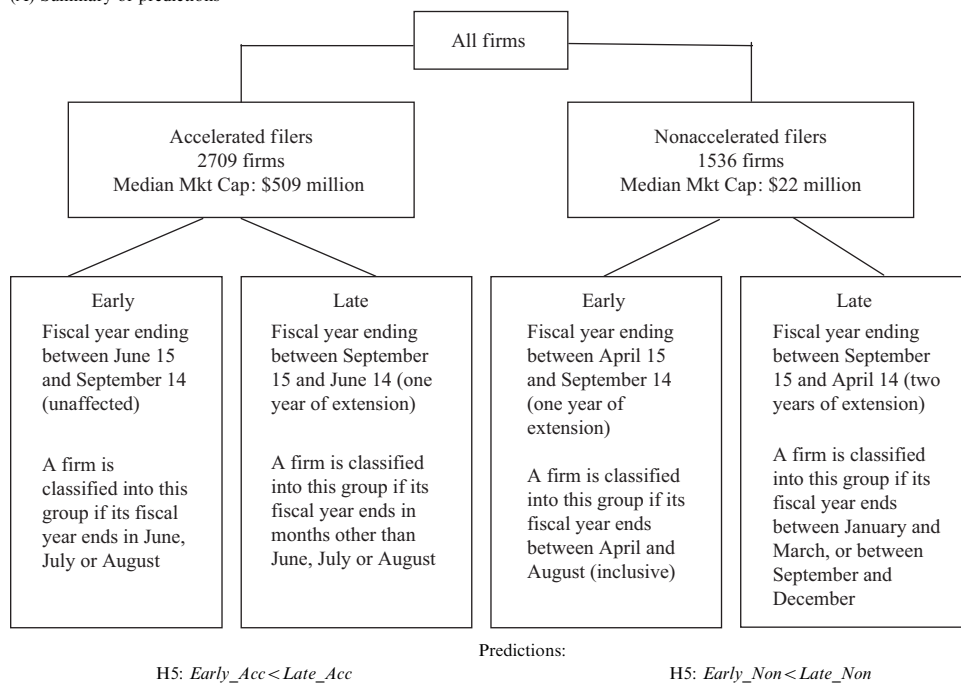
where  $Ind_{ij}$  are industry dummies as defined in regression (2),  $Late\_Non$  equals one for non-accelerated filers that obtain two years of extension and zero otherwise, and  $Late\_Acc$  equals one for accelerated filers that obtain a one year extension and zero otherwise. The variable  $Non\_Acc$  equals one for non-accelerated filers and zero for accelerated filers. H5 predicts that  $a_2$  and  $a_3$  are positive if the deferment is good news. I do not have predictions regarding the difference in reaction between accelerated and non-accelerated filers. As accelerated and non-accelerated filers are treated differently under some other SEC rules, investors could have expected the SEC to treat them differently in this case. Therefore, the sign of  $a_1$  is indeterminate.

The estimation results are reported in Table 6 Panel B. The dependent variable is abnormal returns cumulated over days  $(-1,1)$ ,  $(-3,1)$ , and  $(-5,1)$  around the announcement day, respectively. The regression with  $CAR(-1,1)$  as the dependent

<sup>27</sup>For example, since large banks had been required to file an internal control report to the FDIC before SOX, banks were lobbying for a waiver of Section 404. The final rule of the SEC allows large banks to file one report both to the FDIC and to comply with Section 404. The inclusion of these firms does not affect the tenor of the results.

Table 6  
Market reactions to the announcement of postponing compliance with Section 404

(A) Summary of predictions



Panel: B Regression results

	Prediction	CAR (-1, 1)		CAR (-3, 1)		CAR (-5, 1)				
		Estimate	p-Value		Estimate	p-Value		Estimate	p-Value	
			OLS	Bootstrap		OLS	Bootstrap		OLS	Bootstrap
<i>Non_Acc</i>		0.0060	0.1083	0.4010	0.0057	0.2707	0.4650	0.0092	0.1355	0.4090
<i>Late_Non</i>	+	0.0028	0.3872	0.2860	0.0087	0.0504	0.0870	0.0126	0.0190	0.0530
<i>Late_Acc</i>	+	0.0023	0.5094	0.2220	-0.0028	0.5683	0.2720	0.0004	0.9422	0.4500
<i>Size</i>		-0.0009	0.1635	0.3860	0.0001	0.9503	0.4790	0.0005	0.6033	0.2930
<i>MTB</i>		0.0001	0.7510	0.1170	0.0002	0.6785	0.0340	-0.0002	0.6370	0.6150
Adj. $R^2$		1.08%		2.79%		2.85%				

This table reports the test of market reactions to the announcement of postponing the compliance dates of Section 404 on May 27, 2003.

Panel A summarizes the predictions of H5, which hypothesizes that the postponement is beneficial as it reduces the compliance costs, especially for firms that obtained a longer extension period.

The proposed compliance date was fiscal year ending on or after September 15, 2003. In the final rule, accelerated filers need to comply with Section 404 for fiscal year ending on or after June 15, 2004, and non-accelerated filers were required to comply for fiscal year ending on or after April 15, 2005. In the empirical tests, firms with a market capitalization lower than \$75 million by the end of 2002 are classified as non-accelerated filers (see footnote 4 for the definition of an accelerated filer). Foreign firms and banks are excluded.

Panel B reports the estimation results of the regression that examines the cross-sectional variation in market reactions to the announcement of postponing compliance with Section 404 on May 27, 2003. The announcement day is set to be event day zero. Foreign firms and banks are excluded

Table 6 (footnote continued)

$$CAR_i = \sum_j a_{0j} Ind_{ij} + a_1 Non\_Acc_i + a_2 Late\_Non_i + a_3 Late\_Acc_i + a_4 MTB_i + a_5 Size_i + e_i.$$

There are 2709 accelerated filers and 1536 non-accelerated filers included in estimating the regression. *Late\_Acc* equals one if a firm is an accelerated filer and obtained one year of extension, zero otherwise. *Late\_Non* equals one if a firm is a non-accelerated filer and obtained two years of extension, zero otherwise. *Non\_Acc* equals one if a firm is a non-accelerated filer, zero otherwise.

variable does not reject the null hypothesis that the deferment had no significant impact. However, the regressions with *CAR* (−3, 1) and *CAR* (−5, 1) as the dependent variable show that non-accelerated filers that obtained two years of extension realized significantly higher abnormal returns than non-accelerated filers that obtained a one year extension, consistent with H6. The coefficients on *Size* and *MTB* are largely insignificant. Unreported results based on *CAR* (−4, 1) and *CAR* (−6, 1) show similar inferences. The findings suggest that there could be news leakage prior to the release of the final rule. It is not surprising that the difference between the early and late adopters in the accelerated filers group is insignificant. Given the relatively large fixed costs of Section 404 compliance, the cost savings as a percentage of the market value of large firms are likely smaller than those of small firms.

Table 6 Panel B shows that the cost savings of delaying compliance for one more year are about 1.26% (from the regression with *CAR* (−5, 1) as the dependent variable) of the market value of an average firm in the non-accelerated filers group. The average market capitalization of a non-accelerated filer is \$27 million, which suggests that the estimated cost savings are about \$0.34 million. The average annual revenue of the non-accelerated filers is \$91 million. The FEI January 2004 survey (Financial Executive International, 2005) indicates that the direct initial compliance costs for a firm with annual revenue between \$25 and \$99 million are about \$0.74 million. Compared with FEI's cost estimates, the magnitude of the cost savings appears reasonable.

In summary, the results in Table 6 largely support H5. The compliance costs of Section 404 are particularly significant for small firms and delaying compliance appears beneficial for them.

#### 4.3. Subsequent events

Li et al. (2004) examine both the events leading to the passage of SOX and several events related to the implementation of SOX that occurred between August and December 2002. However, SOX implementation activities continued in 2003. To investigate whether the post-SOX implementation events changed the expected costs of SOX, I examine the implementation activities of the SEC and the PCAOB, as directed by SOX, up to the auditing rule of Section 404 internal control test was proposed by the PCAOB.

Zhang (2005, Table 3) reports U.S. stock returns around the 16 implementation events subsequent to SOX passage. Most of the rulemaking events are not associated with significant market reactions, suggesting that the implementation of SOX did not significantly change the market's expectations.

#### 4.4. Alternative explanations and sensitivity analyses

##### 4.4.1. Alternative explanations

It is likely that some of the abnormal U.S. market returns around the rulemaking event days are not directly attributed to SOX. Both SOX and the message conveyed by SOX about future legislation affected stock prices and their impact cannot be disentangled. As a result, I cannot decisively conclude that SOX itself is costly. Yet, it is likely that the passage of SOX conveys bad news to the market because SOX is costly and signals the likelihood of further anti-business legislation. If SOX were beneficial to business, it is more plausible that investors would expect the government to write similar beneficial legislation in the future. Moreover, the cross-sectional tests in Section 4.2 provide additional support for the conjecture that SOX is costly. It is not clear why the expected costs of future anti-business legislation should vary systematically with firms' purchases of non-audit services, shareholder rights, and the complexity of firms' business.

Second, although returns of non-U.S.-traded foreign firms are used to filter out the impact of global economic news, the documented U.S. cumulative abnormal returns can reflect market reactions to other contemporaneous news unique to the U.S. or to the other foreign markets. However, the cross-sectional findings connect SOX-related legislative activities and the negative returns. If most of the market reactions reflected news unrelated to the SOX rulemaking, firms' abnormal returns would not vary cross-sectionally as predicted.

In addition, as the market expectation of government reaction to accounting scandals is unobservable, I cannot completely rule out the hypothesis that SOX was beneficial but investors had expected different rules to correct the market failures and were dissatisfied with SOX. However, legal researchers, such as Romano (2004), argue that "congressional initiatives rarely are constructed from whole cloth; rather, successful law reform in the national arena typically involves the recombination of old elements that have been advanced in policy circles for a number of years prior to adoption." This argument suggests that rational investors should not assign much likelihood to rules that differ significantly from available options. Future research that provides additional evidence on this alternative hypothesis will extend our understanding of the Act.

##### 4.4.2. Sensitivity tests

To test the impact of the disclosure requirement of SOX, I examine whether firms' cumulative abnormal returns around key SOX events vary with their disclosure practices. I use the S&P financial disclosure rating to proxy for disclosure quality and add it to regression (2). The inclusion of this variable reduces the sample to 421 firms. The disclosure rating is not significantly associated with *CAR*. The coefficient on *Nonaudit* is still significantly negative. The coefficient on *Bindex* remains negative but is insignificant, likely due to the smaller sample size. The coefficient remains insignificant for the smaller sample without the inclusion of the new variable.

Furthermore, I estimate regression (2) using alternative definitions of variables. I replace the governance index (*Bindex*) with measures of institutional investor holding, the percentage of independent members on the audit committee, and the percentage of independent board members. The coefficients on these three variables are negative but insignificant. While this may suggest that the governance results are sensitive to alternative specifications, it is also possible that the audit committee requirement lacks a significant

impact, as NYSE and Nasdaq had already required listed firms to establish independent audit committees with certain exceptions prior to SOX. Moreover, these variables may not capture the overall level of corporate governance. Bainbridge (2002) argues that a firm can have more insiders on the board if more specific knowledge is necessary in the decision making process.

I redefine *Nonaudit* as the logarithm of total non-audit fees minus fees for tax related services (Ferguson et al., 2004; Ashbaugh et al., 2003). All inferences remain intact. However, when the ratio of non-audit fees to audit fees is used, the coefficient on the fee ratio is insignificant. In this specification, it cannot be rejected that the restriction does not impose significant costs on firms. I also estimate an aggregate measure for litigation risks, which is calculated based on Shu's (2000, Table 3) model to predict the likelihood of lawsuits. Again, the inclusion of the aggregate measure does not affect the main results of Table 5.

In the cross-sectional tests, I estimate the market model for individual firms using data prior to the first event to obtain the parameters and then calculate *AR* as the prediction error. Alternatively, following Schipper and Thompson (1983), I estimate the market model using data prior to and during the event period, allowing the intercept to shift around the event days. The coefficients on event-day dummies are then aggregated to compute *CAR*. I re-estimate regression (2) with *CAR* computed in this way as the dependent variable. The inferences are not affected.

## 5. Conclusion

This paper investigates the economic consequences of the Sarbanes–Oxley Act through a study of market reactions around the legislative events prior and subsequent to the passage of SOX. I find that the cumulative abnormal returns of U.S. firms and foreign firms complying with SOX around key SOX events are negative and statistically significant. The evidence is consistent with SOX imposing net costs on complying firms. The cumulative abnormal returns of U.S. firms around all SOX events are negative but not statistically significant. While this finding does not support SOX being costly, it is likely due to the inclusion of insignificant events reducing the power of the test.

Furthermore, I investigate the sources of costs by examining the cross-sectional implications of major provisions of SOX. I find that firms' cumulative abnormal returns around key SOX legislative events decrease with their purchases of non-audit services and the complexity of their business. These findings are consistent with the hypotheses that the restriction of non-audit services and Section 404, requiring internal control tests, impose net private costs on firms. I also find that firms with shareholder rights weaker than their industry peers experienced more negative cumulative abnormal returns around SOX events. Finally, the test of market reactions to the announcement of postponing compliance with Section 404 shows that the postponement is particularly beneficial for small firms.

The findings should be interpreted with caution as evidence of SOX being costly. First, the documented negative cumulative abnormal return around key SOX rulemaking events likely reflects the impact of SOX, the expected costs of future anti-business regulation, and the impact of other contemporaneous news not captured by the expectation models (1a) and (1b). Not all of the documented negative cumulative return can be directly attributed to SOX. However, the cross-sectional test of the paper provides support for the argument

that SOX is likely costly and at least a major part of the negative cumulative abnormal return around key SOX events are related to SOX. Second, as the market expectation is unobservable, I cannot rule out entirely an alternative explanation that the losses reflect investors' disappointment with SOX. While legal research provides little support for this hypothesis, future research that distinguishes between this alternative explanation and the cost explanation could provide stronger evidence regarding the impact of SOX. Third, SOX provisions are correlated, so are the examined firm characteristics in the cross-sectional analysis. Thus, although the cross-sectional results support certain SOX provisions being costly, SOX abnormal returns cannot be decisively attributed to a subset of provisions. Additionally, this paper focuses on an examination of private benefits and costs of SOX. Research on the social benefits and costs of the Act will help depict a more complete picture of SOX.

### Appendix A. Related working papers on market reactions to SOX

Rezaee and Jain (2002) investigate S&P 500 index returns around the events leading to SOX, but the events they examine are largely a subset of the events listed in Table 2. For example, President Bush's speech on July 9, 2002, which the media considered a signal of a change of attitude in Washington, is not included in their study. They find that the abnormal returns are positive around the final legislative events before SOX passage and negative around prior events. They argue that the market reacts positively as uncertainty is resolved and thus conclude SOX is value increasing. However, the market response captures only the unexpected portion of news. If the final rule reveals lower costs on firms than previously expected, positive abnormal returns can be observed around its announcement, even though investors consider the rule to be costly. Indeed, news reports indicated that lobbyists successfully pushed some of their proposals through at the last minute (e.g., Murray and Schroeder, 2002). Moreover, reports prior to the final ruling revealed concerns that the rules would impose greater costs than Sarbanes' bill (Melloan, 2002). Thus, an examination of the cumulative abnormal return around all the SOX events provides stronger evidence than Rezaee and Jain's (2005) focus on the final legislative events.

Rezaee and Jain's (2005) also examine the relation between the abnormal returns of the S&P 500 firms around the final rulemaking event and firm characteristics. They find that firms' abnormal returns increased with their S&P disclosure rating and decreased with their purchase of non-audit services in 2002. The findings are inconsistent with their claim that SOX provides net private benefits for firms. The reliability of their results and conclusion is further confounded by methodology issues (e.g., overlapping event windows and omitted correlated variables).

Li et al. (2004) examine the market reaction to the rulemaking events around SOX passage. However, they also do not provide a complete list of the events. For example, they exclude the negotiation of the House–Senate conference committee starting July 19 as an event. They argue that there was no news leakage prior to the issuance of the conference report on July 24. However, the opening statements of major lawmakers at the first conference meeting on July 19 set the tone of the final bill and were made available to the public. Democrat Rep. LaFalce made a public statement about the progress of the conference on July 22. Moreover, Hilzenrath (July 20, 2002, *WP*), VandeHei (July 21, 2002b, *WP*), Oppel (July 22, 2002, *NYT*), Weisman (July 23, 2002, *WP*), and Murray

(July 24, 2002b, *WSJ*) all discussed specific progress details of the negotiation and lobbying activities. The last two articles also revealed major disputes between the two parties by July 23, citing talks given by lawmakers. These articles do not support the argument of Li et al. (2004). Their cross-sectional test provides little support for their hypothesis that SOX is beneficial.

Another difference between these two papers and my study is that I do not include the presidential approval of the Act (July 30) as a major SOX event. The President's comments in the rulemaking process revealed a strong indication that he would sign the bill into law and thus his approval was well expected. However, both studies find a significant positive cumulative return for the three-day window from July 29 to 31. The value-weighted returns for the three days are 5.31%, 0.47%, and 0.58%, respectively. Only the return of July 29 (Monday) is significantly different from zero. I argue that the positive return of July 29 is likely explained by the passage of the Trade Act or the Homeland Security bill in the House after the close of the stock market on July 26 (Friday). If so, I expect a significant positive return at the opening of the market on July 29. Table 3. Panel B shows that the previous-close-to-open return accounted for almost 40% of the daily return of July 29. Unreported results reveal that the realized market return within 1 h after the opening of the market accounted for 66% of the daily return. The significant positive opening return of July 29 was driven by news released prior to or around the opening of stock market. A search of the Dow Jones Newswire from July 26 to 27 does not find any news about President Bush's approval of SOX. Thus, most, if not all, of the significant positive return on July 29 was likely unrelated to SOX. The positive return should not be included in the test of market reactions to SOX.

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