Sarbanes-Oxley compliance and violation: an empirical study

Elizabeth Webb

Federal Reserve Bank of Philadelphia, Philadelphia, Pennsylvania, USA

Abstract

Purpose – The purpose of this paper is to empirically examine the corporate governance and financial characteristics of firms under the new Sarbanes-Oxley (SOX) accounting regime.

Design/methodology/approach – The paper first compares a comprehensive set of characteristics across firms in two states of SOX Section 404 status–Compliance and Violation. It then tests for determinants of SOX compliance in a logistic regression setting.

Findings – Several differences between compliance groups in terms of equity ownership, board structure, and executive compensation schemes are reported. However, it appears that firms found to be in violation of SOX are not systematically worse when it comes to common measures of corporate governance. The financial structure and soundness of the groups of firms are very similar. The strongest determinant of Section 404 compliance is firm size.

Originality/value – This result supported anecdotal evidence that compliance with SOX is achieved primarily by firms that can afford it. Further, the paper highlights an important policy issue: Is SOX really differentiating firms in terms of corporate governance or in terms of size?

Keywords Corporate governance, Accounting standards

Paper type Research paper

1. Introduction

Following disclosure of corporate fraud and the subsequent collapse of firms like Enron, WorldCom, and Global Crossing, Congress quickly passed the Sarbanes-Oxley (SOX) Act. President Bush signed the act into law July 30, 2002. Intending to protect investors through disclosure, accountability, and accuracy requirements, the *New York Times* (2002) called the act "the biggest overhaul of securities laws since the 1930s". Since its passage in 2002, companies have been required to undergo internal and external validation of compliance with SOX. In particular, Compliance Section 404 of the act states that companies must be subject to a comprehensive evaluation of internal controls with particular focus on financial reporting. Findings from these evaluations are then reported in the firm's 10-K or 10-Q financial statements. The purpose of this study is to examine firms and their Section 404 reports. Firms can fall into one of four categories of Section 404 compliance at a particular point in time: compliance, concerns-raised, non-compliance, or violation. In this paper, I analyze the governance structure and financial characteristics of firms in the two extreme categories.

This study is important because it empirically examines a significant governance policy that has not yet been fully addressed in the academic literature. Several studies note the significant costs and difficulties firms face complying with SOX. For instance, Block (2004) cites that firms are going private at unprecedented rates. Firms from his survey point to the rising costs of SOX compliance as a major factor in the decision to go private. In fact, Loeb (2005) reports that firms are experiencing an average increase

of 90 per cent in accounting costs to comply with SOX. The *Wall Street Journal* reported that companies in 2005 will spend in aggregate $6.1 billion on SOX compliance – $2 billion going to tech spending, stating "it is the best thing to happen to the sector since the Y2K panic" (Bulkeley and Forelle, 2005). Also, a study by Financial Executives International cited that 94 per cent of the firms polled said the costs of SOX outstrip the gains. These studies point to a phenomenon whereby firms are facing significant financial strain while trying to comply with SOX. Further, Section 404 is specifically cited as contributing to a large portion of the cost in complying with SOX among small firms (Greifeld, 2006). Size and firm performance may be an issue in SOX compliance and violation, yet this anecdotal evidence has not been tested empirically.

The contributions of the study are threefold. First, I provide an appropriate and timely study that analyzes those firms that are deemed in compliance with SOX and compare those to the corporate governance of firms in violation of SOX. Second, this study is unique as it is the first to comprehensively examine SOX firms using an extensive array of corporate governance and financial variables. Third, this study provides new information on corporate governance, which is especially important today as attempts to install investor trust in US markets and accounting practices continue.

The main findings of the paper are as follows. Several differences exist in both governance and financial characteristics between firms in compliance with Section 404 and firms in violation. However, particularly in the case of board characteristics, the extent of these differences is not exhaustive. Firms that are compliant with Section 404 tend to be larger, yet do not necessarily pay more for audit services than other firms. Compliant firms have generally less insider equity ownership than other firms and tend to offer their CEOs higher salaries and other forms of compensation. I also find that few governance variables explain variation in the probability of compliance and that firm size is an influential factor in Section 404 compliance. These results suggest that larger firms have an easier time complying with the Act than smaller firms, all else being equal, and that governance structure has less of an impact.

1.1 Background of the SOX Act

In 2002, a series of corporate fraud disclosures and a call for improvements in disclosure and financial reporting by SEC chairman Harvey Pitt prompted a response from policymakers in the Bush administration. President Bush stated in a highly publicized speech in July 2002, "My administration will do everything in our power to end the days of cooking the books, shading the truth, and breaking our laws". Following these events, the bill sponsored by Senator Paul Sarbanes and Congressman Michael Oxley was passed. The Act calls for all public companies to adhere to three major provisions, which include: criminal and civil penalties for non-compliance; certification of internal auditing by external auditors; and increased disclosure of financial statements.

The act is organized into 11 sections. In terms of compliance, some of the most important include sections on auditor independence, corporate responsibility, enhancement of financial disclosures, and corporate, and criminal fraud accountability. In particular, Section 404 outlines management assessment of internal controls (enhanced financial disclosures). As of July 15, 2005, firms are required to submit reports of internal control effectiveness (and any material weaknesses) as well as Section 404 compliance status within quarterly financial reports. Chief executives and

chief financial officers must sign off on the Section 404 compliance report. Managers are discouraged from signing false reports with threats of 20-year prison sentences for doing so.

Since Section 404 primarily calls for proper internal controls (including auditor and board standards), I analyze reports from firms regarding compliance with this section. One would expect that firms with stronger internal controls, i.e. firms with independent boards and proper managerial incentives, should more likely be in compliance with this section of the SOX Act. Indeed, Akhigbe and Martin (2006) find that firms with strong corporate governance (independent boards) had a stronger positive response to the passage of SOX compared to that of firms with weaker boards in a sample of financial service firms. The authors state that more independence on the board and on committees may be associated with a greater motivation to monitor the firm. I do not limit the study to boards, however. Instead, I look at a wide variety of governance characteristics present in firms citing compliance or violation of Section 404 of SOX.

In addition, as the popular press continues to cite unjustifiably high SOX compliance costs, I also posit that larger, more profitable firms will have an easier time complying with Section 404. On the other hand, complex firms, which are often large, may have more difficulty with SOX compliance and therefore mitigate any benefit that size has on compliance ease and feasibility. To this end, the relationship between financial characteristics and SOX compliance remain an empirical issue.

The rest of the paper is presented as follows: section 2 provides theoretical background into corporate governance areas including equity ownership, board structure, and executive compensation. Section 3 illustrates the data and methodology used in the study. Section 4 reports the results of the statistical analyzes. Section 5 concludes.

2. Corporate governance background
2.1 Equity ownership
Equity ownership structure potentially alters incentives for executives and members of the board of directors to act on behalf of shareholders. For example, according to Steiner (1996), institutional owners and outside blockholders, which are generally less subject to management influence, may reduce managerial entrenchment and act as an additional managerial oversight mechanism. In this way, these equity owners motivate managers to work in the best interest of shareholders.

However, optimal insider equity ownership is less obvious to identify. Morck *et al.* (1988) identify two contrasting forces in the relationship between insider ownership and firm value. On the one hand, managers and directors owning little equity in the firm may have diminished incentives to work for shareholder interest since interests are not aligned; this leads to the conclusion that high insider ownership is optimal. On the other hand, insiders owning large proportions of outstanding equity may act in their own best interests and disregard their responsibilities to shareholders, therefore supporting a low degree of insider equity ownership. Empirical studies have shown that a non-linear relationship exists between insider equity ownership and firm performance. For example, McConnell and Servaes (1990) report a curvilinear relationship between Tobin's Q and the per cent of shares owned by firm insiders. Performance tends to increase until insiders have approximately 40-50 per cent of the common shares outstanding, after which performance declines. Pantzalis *et al.* (1998)

also find that firms with both low and high extremes of insider ownership have high agency costs of free cash flow.

Since SOX compliance firms are likely to be strong financial performers, I expect that insiders – such as managers and founders – have non-extreme equity ownership levels. This expectation is graphically depicted in Figure 1 (this figure is similar to that presented in McConnell and Servaes (1990) where the *y*-axis in that paper represents Tobin's Q). Although this relationship is not testable using traditional pairwise comparisons (such as a *t*-test), I also analyze the difference between institutional and blockholder ownership (i.e. outside shareholders owning 5 per cent or more stock outstanding) at compliance and violation firms. I expect that institutional and blockholder ownership is higher at compliance firms compared with that at violation firms, as per Steiner (1996). However, since size may be a confounding variable in this relationship in the banking industry as per Hirshey (1999), I may be testing a size effect rather than an equity ownership effect. Therefore, I control for size in the empirical tests. In Table I, I summarize the equity ownership variables and the expected signs between SOX compliance and violator firms[1].

2.2 Board structure
Core *et al.* (1999) find that firms with weak governance structures have more agency problems than do firms with strong boards. They find an inverse relationship between strength of the board of directors and characteristics such as insider representation on the board, board size, and CEO/chairman duality. Beasley *et al.* (2000) report a direct link between weak governance structure and agency problems as well as subsequent poor firm performance. In their paper, they analyze board characteristics of firms with instances of financial statement fraud and compare these results to a benchmark sample. Results indicate that the fraudulent companies have weak (ineffective) governance structures relative to the benchmark firms. The idea that agency problems are exacerbated under conditions of weak board structure is noted in Howton *et al.* (2001). Here, the authors show that a strong board alleviates agency problems between managers and shareholders and thus reduces the extent of IPO underpricing.

Following Beasley *et al.* (2000), the expectation is that SOX compliant firms should have stronger board structures than SOX violators. This is expected since one of the purposes of the SOX Act and of Section 404 in particular is to curtail non-independent boards, thus preventing director inaction and complacency in times of executive misdoings. Using a wide range of board structure variables, I expect that SOX-compliant firms will have boards with more characteristics indicative of board
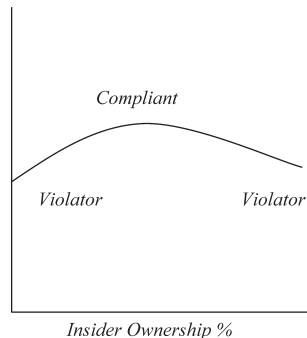

Figure 1.
Expected insider ownership per cent at compliant and violator firms

Equity ownership characteristic	Description	Expected sign (compliance–violation)
Percentage held by dominant shareholder	Proportion of shares held by the controlling shareholder; often the founder. Many firms do not report a dominant shareholder	?
Percentage held by insiders	Proportion of shares held by insiders of the company, i.e. employees of the firm, their immediate families, and directors	?
Percentage held by blockholders	Blockholders refer to shareholders owning at least 5% of stock outstanding	+
Percentage held by institutions	Proportion of shares owned by institutions, e.g. pension firm, financial firms, other corporate entities	+

Note: This table describes the four equity ownership variables used in this study and the expected sign on tests for differences in means between compliance and violation firms (compliance–violation)

Table I.
Equity ownership
characteristics

independence. Specifically, I expect that compliance firm boards will be smaller than violator boards. Also, I expect smaller proportions of insiders and gray directors (directors who are not employees of the firm, but receive payment from the firm for services unrelated to director duties, such as consulting) on compliance firm boards than on violator boards. Further, according to Core *et al.* (1999), the proportion of directors older than age 70 is negatively related to board strength because these individuals may become less effective and independent as they age. Therefore, I expect compliance firms to have smaller proportions of directors older than age 70 than violator boards.

Beasley (1996) finds that as outside director tenure on the board increases, the likelihood of financial statement fraud decreases. This relationship may indicate that directors improve as their experience level increases. I expect director tenure to be longer for compliance firms (indicating board strength) than for violator firms. Carter *et al.* (2003) report that minorities, particularly women, on the board contribute to overall board strength and independence. Therefore, I expect larger proportions of women on the board in compliance firms compared to violator boards. Ferris *et al.* (2003) find that busy directors and directors who are CEOs of other companies are often found on strong performing firms' boards and that these outside obligations do not influence directors to shirk their shareholder responsibilities. Therefore, I expect that compliance boards have larger percentages of busy directors and directors who are CEOs of other firms than violator boards. Further, in predicting SOX compliance, board independence (as measured by board characteristics) should be positively related to SOX compliance. Each of these variables and expected signs for the difference in means are summarized in Table II.

2.3 Executive compensation
Equity-based compensation has traditionally been used to align interests between managers and shareholders. Theoretically, equity-based compensation mitigates the manager-shareholder or principal-agent problem. With these contracts, executives

Board characteristic	Description	Expected sign (compliance-violation)
Number of directors	Number of directors on the board of directors	−
Insiders percentage	Number of directors who are current *or former* employees of the firm or are related (wife, sibling, etc.) to an employee of the firm, divided by the total number of directors	−
Outsiders percentage	Number of directors who have no ties to the firm other than directorship (i.e. not a present/past employee of the firm, consultant to the firm, or related to an employee of the firm) divided by the total number of directors	+
Gray percentage	Number of directors who are not employees of the firm, but receive payment from the firm for services unrelated to director duties, such as consulting, working for a law or accounting firm that provides services for the firm, divided by the total number of directors	−
Directors over 70%	Number of directors over the age of 70 divided by the total number of directors	−
Directors with over 15 years tenure percentage	Proportion of the board made up of directors with more than 15 years tenure on the board	+
Female directors percentage	Proportion of the board made up of women	+
Busy directors percentage	Proportion of the board made up of directors who currently are on three or more other boards	+
Directors active CEOs percentage	Proportion of the board made up of directors who are currently CEOs of a different firm	+

Table II.
Board of director characteristics

Note: This table describes the nine board of director variables used in this study and the expected sign on tests for differences in means between compliance and violation firms (compliance–violation)

maximizing their personal welfare will find it financially rewarding to expend greater effort to maximize firm value, which improves shareholder wealth. Traditionally, equity-based compensation consists of non-cash sources of compensation, including stock options, restricted stock grants, and long-term incentive plans (LTIPs).

Core *et al.* (2003) show that equity-based compensation works to both motivate executives to maximize firm value and to mitigate agency problems between managers and shareholders. Using a combination of monitoring and incentive contracts, Hall and Liebman (1998) argue that this compensation structure can effectively align interests between executives and shareholders. In addition, they show that the growth in stock options and other sources of equity-based CEO compensation increased dramatically in the 1980s and 1990s. About 70 per cent of CEOs in 1994 were paid with stock options in addition to traditional cash-based compensation, up from 30 per cent in 1980. However, this trend may be reversing, as the AFL-CIO reports that 31 per cent of CEOs' compensation was made up of stock options in 2004, which is down from 69 per cent in 2001[2].

Shleifer and Vishny (1988) contend that equity-based compensation should reduce the instance of managers engaging in non-value-maximizing behavior since the manager's personal wealth is tied to that of the firm. Guay (1999) and Smith and Stulz (1985) suggest that equity-based compensation increases the relationship between executives' wealth and firm performance, thus providing more incentive for the executives to work to maximize shareholder wealth. In addition, Guay (1999) finds that executives with incentive contracts in their compensation structure will be more likely to invest in risky projects that increase firm value. For instance, Arora and Alam (2005) find that after the adoption of LTIPs managers are more aligned with stakeholder incentives – most notably shareholders.

Theory on executive compensation generally focuses on structure rather than level. Therefore, I limit my hypothesis on CEO compensation at compliance and violator firms to equity vs cash-based compensation. I expect that CEOs from SOX-compliant firms have higher proportions of equity-based compensation out of total compensation than CEOs from violator firms. In addition, I analyze CEO compensation levels at SOX compliance and violating firms. Because compliance firms are expected to be larger (and stronger financial performers), compensation level should be higher at compliance firms relative to violators. On the other hand, one could argue that violation firms may pay CEOs excessively, thus have higher compensation levels than firms that comply with Section 404. To this end, compensation level remains an empirical issue. Compensation variables are analyzed and the expected sign for the difference between compliance and violator firms is reported in Table III. The variables of interest include proportion of equity-based compensation and proportion of cash-based compensation, yet all elements of CEO compensation are listed for completion.

3. Data and methodology
To begin, I collected all reported incidences of SOX Section 404 compliance and violation listed in the Board Analyst database as of the second quarter of 2005. Board Analyst is a data source that supplies corporate governance information on more than 2,100 US firms. The firms in Board Analyst come from the S&P Composite 1500, *Fortune* 1000, Russell 1000, and the DSI 400. The database extensively covers information concerning SOX and provides Section 404 reports for firms within the database, which is what I used for this study. Since July 15, 2005, these reports, which are approved by managers, are disclosed in public firms' quarterly 10-Q and annual 10-K statements. A firm is deemed to be compliant with SOX Section 404 if its financial reporting and internal controls are consistent with the criteria set forth by the Committee of Sponsoring Organizations of the Treadway Commission. These financial reporting standards and internal controls must also be effective and operational to be considered SOX-compliant. Violations of Section 404 include firms with material deficiencies in internal controls over financial reporting, IT, security, and oversight and monitoring[3].

In order to isolate the differences among the two SOX status types, I eliminated firms which in the previous quarter (1Q2005) reported a different SOX status. In other words, a firm in violation of SOX in the second quarter of 2005 that also reported a compliance status in the first quarter of 2005 was eliminated from the final sample. I used all firms in the violation category that do not overlap with other categories from the previous quarter. However, due to the tedious nature of hand collecting corporate governance variables, I took a random sample of SOX-compliant firms to use in the

CEO compensation characteristic	Description	Expected sign (compliance-violation)
Salary	Dollar value of the base annual salary	+
Bonus	Dollar value of the bonus earned by the CEO	+
Other annual compensation	Annual compensation that is not categorized as salary or bonus but is considered cash. It includes items such as perquisites and other personal benefits, above-market earnings on restricted stock and options, tax reimbursements, and the dollar value difference between the price paid by the CEO for company stock and the actual market price of the stock	+
LTIP	Amount paid out to the CEO under the company's LTIP, which measures company stock performance over a period of more than one year (generally three years)	+
All other compensation	Includes the following: severance payments, debt forgiveness, payment for unused vacation, signing bonuses, 401 K contributions, and life insurance premiums	+
Restricted stock grants	Value of restricted stock granted during the year, the resale of which is barred for about three to five years	+
Real option value	Valued using the Black–Scholes options-pricing formula and representing the total value of all options received during the year	+
Exercisable option value	Value of options that could be exercised at the time of financial statement reporting	+
Unexercisable option value	Value of options that could not be exercised at that time	+
Equity percentage	The sum of LTIP, all other compensation, restricted stock grants, and real option value divided by total compensation	+
Cash percentage	The sum of salary, bonus, and other annual compensation divided by total compensation (1-equity percentage)	−

Table III.
Executive compensation characteristics

Note: This table describes the 11 CEO compensation variables used in this study and the expected sign on tests for differences in means between compliance and violation firms (compliance–violation)

final sample (because there are more than 1,000 firms in the compliance category). Every tenth firm in an alphabetical listing of compliance firms that does not overlap with other categories of SOX compliance in the previous quarter is selected. The final sample contains 102 compliant firms and 87 violators[4].

I used the most recent proxy statement to collect corporate governance variables. These variables include details on equity ownership, board of directors, and executive compensation. Using Compustat I collected firm financial characteristic data as of year-end 2004.

4. Results

4.1 Univariate tests

4.1.1 Governance characteristics. Table IV presents results of difference in means and medians tests for equity ownership and board of director characteristics in SOX Section 404 compliance and violation firms. In the first panel, only the per cent of

	Compliance mean	Violator mean	Difference	t-statistic χ² (Kruskal–Wallis)
Ownership				
Percentage held by dominant shareholder	7.670	10.202	−2.532	−0.95 1.227
Percentage held by insiders	9.292	11.126	−1.833	−0.93 2.436
Percentage held by blockholders	21.851	26.521	−4.670	−1.88* 6.134**
Percentage held by institutions	64.839	55.008	4.742	1.07 0.477
Board of directors				
Number of directors	9.873	8.977	0.896	2.48** 4.474**
Insiders percentage	16.763	16.715	0.048	−0.03 0.879
Outsiders percentage	71.463	70.696	0.767	0.33 0.360
Gray percentage	11.775	12.589	−0.814	−0.43 0.571
Directors over 70%	7.620	8.442	−0.822	−0.48 0.051
Directors with over 15 years tenure percentage	14.247	7.642	6.605	3.18*** 7.381***
Female directors percentage	10.892	10.130	0.762	0.58 1.492
Busy directors percentage	15.934	12.272	3.662	1.82* 2.499
Directors active CEOs percentage	29.192	26.738	2.454	1.19 0.586

Notes: This table presents tests for differences in means and medians between equity ownership and board of directors characteristics for the sample of SOX-compliant firms ($n = 102$) and SOX-violation firms ($n = 87$). Difference column represents compliance mean minus violation mean. *, **, *** represent statistical significance at the 10%, 5%, and 1% level, respectively

Table IV.
Compliant versus
violation firms: equity
ownership and board of
directors

outstanding stock owned by blockholders (shareholders owning 5 per cent or more shares outstanding) is significantly different between samples with violation firms having more of a higher concentration of blockholders (27 per cent) than Compliance firms (22 per cent). This is not consistent with the expected direction. It is worth noting that the sign for the differences in this panel are negative for three of the four ownership variables, indicating that violation firms are more closely held than compliance firms. Consistent with expectations, institutional ownership is higher at compliance firms (65 per cent) than at violation firms (60 per cent); however, this difference is not statistically significant. Overall, compliance firms seem to be more widely held than violator firms; but in general, equity ownership between the two SOX status groups is similar.

In the second panel of Table IV, only two of the nine board of director variables are statistically significantly different between samples: number of directors and directors with more than 15 years of tenure (a third variable – percentage of busy directors – is marginally significant). There is, on average, one more director on compliance firms' boards than on violation boards (which is contrary to expectations). This difference is significant at the 5 per cent level using difference in means and medians tests. Also, the proportion of directors with long tenures on the board is larger at compliance firms than violation firms (the difference is 6.6 per cent, which is significant at the 1 per cent level); this result is consistent with the expected sign. There are more busydirectors on compliance firm boards than violator firms. Busy directors make up approximately 16 per cent of compliance firm boards compared with 12 per cent on violator boards.

Differences in most other board characteristics, while not statistically significant, are consistent with expectations. For instance, compliance firms have a higher percentage of outsiders on the board (71.5 per cent) than violator firms (70.7 per cent) and, on average, there are more female directors on compliance boards (11 per cent) than on violator boards (10 per cent).

Overall, there is not a statistically significant difference in board structure characteristics between SOX Section 404 compliance and violating firms. As with equity ownership structure, the two SOX status groups are remarkably similar. This implies that violating firms do not have a poor governance structure; they do not appear to have, for instance, insider-dominated boards or excessive insider equity ownership.

4.2 Compensation structure

The results for difference in means and medians tests for compensation structure are presented in Table V. The main hypothesis in this section is that compliance firms pay CEOs with more equity-based compensation (as a proportion of total compensation) than violator firms. Theory suggests that equity-based compensation should incentivize executives to work in shareholders' best interest and is therefore indicative of good corporate governance. Tests for mean and median differences between the proportion of total compensation made up of equity (or cash) are not statistically significant. compliance and violator CEOs have remarkably similar compensation structures. On average, both groups' CEOs receive approximately 40 per cent equity- and 60 per cent cash-based compensation. This does not support the hypothesis that compliance firms, while assumed to be practicing good corporate governance, have higher percentages of equity-based compensation than their counterpart firms that are Section 404 violators. Further, it is evident that CEOs from firms in violation of Section 404 do not receive excessive compensation; in fact, their pay is, on average, less than CEOs from Section 404 compliant firms.

	Compliance mean	Violator mean	Difference	t-statistic χ^2 (Kruskal–Wallis)
Salary ($K)	736.292	656.080	80.212	1.63 4.414*
Bonus ($K)	1,530.073	803.723	726.349	2.12* 17.164**
Other annual compensation ($K)	113.496	53.348	60.148	1.34 0.752
LTIP ($K)	645.602	279.306	366.295	0.84 0.489
All other compensation ($K)	169.409	167.831	1.579	0.02 0.001
Restricted stock grants ($K)	966.984	610.951	356.032	1.40 1.377
Real option value ($K)	1,995.370	2,065.962	−110.592	−0.14 4.570*
Exercisable option value ($K)	11,373.265	9,556.679	1,816.586	0.42 9.456**
Unexercisable option value ($K)	3,014.041	3,180.954	−166.913	0.17 2.349
Equity percentage	40.692	40.389	−0.003	−0.07 0.011
Cash percentage	59.308	59.611	0.003	0.07 0.011

Notes: This table presents tests for differences in means and medians between equity ownership and board of directors characteristics for the sample of SOX-compliant firms ($n = 102$) and SOX-violation firms ($n = 87$). Difference column represents compliance mean minus violation mean. *, **, *** represent statistical significance at the 5%, 1%, and 10% level, respectively

Table V.
Compliant versus violation firms: CEO compensation

More pronounced differences between SOX Section 404 compliance and violation firms are found when examining median CEO compensation level values. Salary, bonus, and exercisable option value for compliance firms' CEOs are higher than violation CEOs, which is consistent with expectations since compliance firms are likely larger (and stronger financial performers) than violators. Compliance firm CEOs, on average, make approximately $80,000 more per year in salary and more than $700,000 more in bonuses than their violator CEO counterparts. Both salary and bonus compensation are statistically significantly different between these groups. Further, compliance CEOs have higher exercisable option values than violator CEOs. Overall, Section 404 compliance firms pay their CEOs more in terms of other annual compensation, LTIPs, all other compensation, and restricted stock grants. Violator CEOs have higher real option values and unexercisable option values than compliance CEOs. These differences, however, are not statistically significant.

4.3 Financial characteristics

I next analyzed the financial performance and structure of the two SOX Section 404 status groups. The expectation is that compliance firms are larger and better performing than violation firms. As proxies for firm size, I calculated average and median values of total assets, PP&E, common shares traded during the year, number of employees, capital expense, and R&D expense. I also measured total audit fees paid since this may impact Section 404 compliance. Performance is measured by net sales, common stock value, and two measures of growth: capital expenditures divided by assets, and R&D expense divided by assets. Since profitability may also impact SOX compliance (i.e. more profitable firms have an easier time bearing the compliance costs) I also analyzed the ratio of net sales to total assets, which measures the efficiency with which the firm is using its assets. The results of the analysis are presented in Table VI.

	Compliance mean (median)	Violator mean (median)	Difference	t-statistic χ^2 (Kruskal–Wallis)
Total assets ($MM)	13,401.690 (3,175.52)	17,759.580 (1,265.39)	−4,357.890 (1,910.13)	−0.39 9.701*
Property, plant, and equipment ($MM)	2,840.550 (328.80)	1,476.110 (238.00)	1,364.260 (90.80)	1.32 3.289**
Net sales ($MM)	5,708.260 (1,383.33)	3,945.000 (1,279.91)	1,763.260 (103.42)	0.81 2.174
Common shares traded calendar year (MM)	232.046 (106.19)	229.324 (115.71)	2.722 (−9.52)	0.06 0.000
Employees (thousands)	15.262 (4.30)	13.845 (4.79)	1.417 (−0.49)	0.23 0.127
R&D expense ($MM)	166.906 (19.86)	58.178 (2.40)	108.728 (17.46)	1.30 5.073***
Common stock value ($MM)	265.557 (3.72)	232.746 (0.57)	32.811 (3.15)	0.15 10.144*
Capital expenditures /assets	0.042 (0.024)	0.051 (0.035)	−0.008 (−0.011)	−1.12 1.130
R&D expenditures/ assets	0.046 (0.011)	0.031 (0.001)	0.015 (0.010)	1.08 2.999**
Total audit fees paid ($)	4,118,154.13 (2,194,157.00)	4,591,482.91 (2,324,861.00)	−473,329.00 (−130,704.00)	−0.46 0.021
Net sales/assets	0.787 (0.666)	1.149 (0.901)	−0.362 (−0.235)	−2.34*** 5.407***

Table VI.
Compliant versus violation firms: financial characteristics

Note: This table presents tests for differences between financial characteristics for the sample of SOX-compliant firms ($n = 102$) and SOX-violation firms ($n = 87$). Difference column represents compliance mean minus violation mean. MM indicates millions. *, **, *** represent statistical significance at the 1%, 10%, and 5% level, respectively

While the mean difference between total assets for compliance and violation firms is negative (−$4,358 million), the median difference is positive and significant at the 1 per cent level, offering evidence suggesting that compliance firms tend to be larger than violation firms. However, median comparisons may not provide infallible evidence on the difference between the groups since comparisons use only one firm from each group[5]. This pattern seems to continue for several variables; while mean differences between the two samples are small, median differences are positive and statistically significant. Property, plant and equipment is, on average, $1,364 million higher at compliance firms compared with violation firms. Median difference is statistically significant at the 10 per cent level. Average R&D expense is larger for compliance firms ($167 million) than violation firms ($58 million). However, tests for mean differences are not significant; median differences are significantly different between groups at the 5 per cent level. This difference contributes to a significant difference in growth rates (R&D expense divided by total assets) between samples. An alternative measure of growth (capital expenditures divided by total assets) is not statistically significantly different between samples. Net sales, another measure of performance and profitability, are higher at compliance firms ($5,708 million) than at violation firms ($3,945 million). This difference is not statistically significant, though. The efficiency ratio, net sales to total assets, is actually higher on average at violation firms (1.15) compared with compliance firms (0.79).

These results are consistent with the expectation that compliance firms are on the whole larger and better-performing than SOX Section 404 violators. However, it is also evident that violator firms are not poor financial performers. Performance measures are positive for both compliance and violator firms with the only statistically significant difference being between median values.

Overall, the results of the univariate analyzes of SOX-Compliant vs violation firms reveal that the companies are remarkably similar in terms of most corporate governance and financial variables. It appears that those firms found in violation of SOX are not systematically worse when it comes to common measures of corporate governance. They do not have insider-dominated boards, nor do they offer their CEOs excessive salaries or stock options. Further, the financial structure and soundness of the two groups of firms is very similar – although compliance firms tend to be larger on average than violators.

Several variables are statistically significantly different between samples. Compliance firms, on average, are more widely held than violation firms. The number of directors and the proportion of directors with long tenures on the board are relatively higher at compliance firms. Further, compliance firms' CEOs receive a larger salary and bonus than Section 404 violators. Compliance firms also tend to be larger (in median values) than violation firms.

In the following section, I analyzed these and other variables in a multivariate setting. Specifically, I looked at models to predict SOX Section 404 compliance.

4.4 Multivariate analyzes – logistic regression
4.4.1 Theoretical determinants of SOX compliance. I next turned to a multivariate analysis of SOX-compliant versus SOX-violation firms. Using a logistic regression model, I predicted the likelihood of a firm being in compliance with Section 404 of SOX. Each model incorporates industry fixed effects. (The coefficients are not reported, however.) The first specification utilizes corporate governance theory to predict the probability of SOX compliance. Specifically, the model is as follows:

$$\Pr(y = 1) = \Pr\left[\begin{matrix}\alpha_1 + \alpha_2\text{PCHELDINS} + \alpha_3\text{PCOUTSIDE} \\ +\alpha_4 \ln(\text{FIRMSIZE}) + \alpha_5\text{PCEQUITY} + \alpha_6\text{GROWTH} + \upsilon > 0\end{matrix}\right]$$

where PCHELDINS is the percentage of outstanding equity owned by firm insiders (executives), PCOUTSIDE represents the proportion of outsiders on the board of directors, FIRMSIZE is the firm's total assets as of year-end 2004, PCEQUITY is the proportion of CEO equity-based compensation out of total compensation, and GROWTH is calculated by dividing capital expenditures into total assets. Here, $y = 1$ if it is a SOX-compliant firm, and $y = 0$ if it is a SOX-violation firm[6]. The hypothesized direction for each variable used in the logistic model corresponds to the sign reported in Tables I to III.

Results from this analysis are reported in Table VII (Model 1). Only one of the five independent variables was significant in predicting SOX-compliant status. Larger firms (in terms of total assets) were more likely to be SOX-compliant than violators. This result was consistent with results from the univariate analyzes. Further, it supports the hypothesis that larger firms have an easier time complying with SOX than do smaller firms. However, contrary to expectations, corporate governance variables, such as insider equity holdings, percentage of outsiders on the board of directors, and CEO compensation structure, were not significant in the model. The

	(1)	(2)	(3)	(4)
Intercept	−2.158	−3.042	−5.197	−1.664
	(1.77)	(2.06)	(9.04)*	(0.47)
Percentage held by insiders	−0.005			−0.006
	(0.14)			(0.26)
Outsiders percentage	0.615			
	(0.21)			
Log (total assets)	0.273	0.504	0.510	0.292
	(3.55)**	(7.29)*	(9.77)*	(3.35)**
Equity percentage	−0.531	0.105		
	(0.62)	(0.019)		
Capital expenditures/assets	−0.754			
	(0.02)			
Log (number of directors)		0.069		
		(0.00)		
Directors with over 15 years tenure percentage		4.703	4.739	
		(6.79)*	(7.57)*	
Audit fees/total CEO compensation		−0.576	−0.577	
		(12.21)*	(12.33)*	
Cash percentage			2.26	
			(6.97)*	
Log (total CEO compensation)				−0.019
				(0.01)
Likelihood ratio	35.57*	57.36*	57.35*	34.41*

Notes: This table presents coefficients from logistic regressions with industry fixed effects where the dependent variable=0 if the firm is a SOX-violation firm ($n = 87$) and 1 if a SOX-compliant firm ($n = 102$). Model (1) uses variables from previous literature, Model (2) uses board structure and compensation variables, Model (3) uses variables from stepwise logistic regression analysis, and Model (4) uses factor analysis to produce variables. Chi-square statistics are reported under coefficients. *, **, *** represent statistical significance at the 1%, 10%, and 5% level, respectively

Table VII.
Determinants of SOX compliance

growth measure is used as a control variable in the model. Overall, the model's likelihood ratio indicated that it is not significant.

4.5 Concentration on board characteristics

Next, I used board variables that are found to be significantly different between samples in the univariate analyzes presented above. In addition, to control for mitigating effects of different corporate governance activities, I included the CEO's proportion of equity-based compensation. Also, to control for audit-specific pricing, I used audit fees as a percent of total CEO compensation as an additional independent variable in the model. Log of total assets is used to control for firm size. The model is as follows:

$$\begin{aligned} \Pr(y=1) \\ = \Pr\left[\begin{array}{l} \alpha_1 + \alpha_2 \text{PCEQUITY} + \alpha_3 \ln(\text{DIRECTORS}) \\ + \alpha_4 \text{PC15TENURE} + \alpha_5 \text{FEESTOCOMP} + \alpha_6 \ln(\text{FIRMSIZE}) + \upsilon > 0 \end{array}\right] \end{aligned}$$

where PCEQUITY is the proportion of CEO equity-based compensation out of total compensation, DIRECTORS is the number of directors on the board, PC15TENURE is the proportion of the board made up of directors with more than 15 years tenure on the board, and FEESTOCOMP represents audit fees divided by total CEO compensation.

The results of Model 2 are presented in Table VII. First, notice that the significance of the overall model (likelihood ratio) is larger than in Model 1. Equity-based compensation and board size are not significant determinants of SOX compliance after controlling for firm size, director experience, and audit expense.

The coefficient of directors with more than 15 years of tenure on the board is positive and significant at the 1 per cent level. This indicates that boards with high proportions of directors who have been sitting on the board for long time periods are more likely to be from SOX-compliant firms than violation firms. This is consistent with the univariate tests presented in Table IV (and consistent with the hypothesized direction). As the audit fees increase as a percent of the CEO's total compensation, the probability of a firm being SOX-Compliant is 36 per cent[7]. However, total audit fees paid (not presented) is not a significant predictor of SOX compliance.

4.6 Determinants from stepwise logistic regression

For further analysis, I used a stepwise logistic regression to extract independent variables from the entire population of governance and financial variables to use in Model 3. Although it is preferred to build a model based on theory, I used a stepwise regression technique to ascertain variables that can predict SOX compliance or violation, since theory – as seen in Model 1 – is not entirely successful at the task. Stepwise logistic regression uses chi-square statistics to automatically determine which variable to add or drop from the model. Results from the stepwise regression yield the following specification:

$$\Pr(y=1) = \Pr\left[\begin{array}{l} \alpha_1 + \alpha_2 \ln(\text{FIRMSIZE}) + \alpha_3 \text{PC15TENURE} \\ + \alpha_4 \text{FEESTOCOMP} + \alpha_5 \text{PCCASH} + \upsilon > 0 \end{array}\right]$$

In this model, the new variable PCCASH indicates the proportion of total CEO compensation that is comprised of cash-based compensation (salary, bonus, and other

cash received on an annual basis). None of the equity ownership variables was selected for the model; however, board and compensation variables were used in the final specification. The results are presented in Table VII, Model 3.

Firm size continues to be a significant determinant of SOX compliance. The probability of being SOX Section 404 compliant increases with total assets. Again, directors with longer board tenure (PC15TENURE) increase the likelihood of SOX compliance. The coefficient is significant at the 1 per cent level. Further, audit fees as a percent of total compensation increases the likelihood of SOX violation (consistent with Model 2). Increasing cash-based (as opposed to equity-based) compensation yields an increased chance of achieving SOX compliance. This result is contrary to the expected sign of the coefficient. Overall, the model is significant at the 1 per cent level.

4.7 Factor analysis determinants

Finally, I used factor analysis to identify three independent variables to use in the model. Factor analysis, like stepwise regression, is not a preferred method of model design, but it can yield interesting insights from a large array of variables, such as in the present study. Factor analysis attempts to find unobserved factors that largely or entirely explain observed variables. Here, I identified three factors, which, upon principal component observations, can be thought of as a size factor, an ownership factor, and a compensation factor. Variables in the size factor include sales, number of employees, and total assets. The ownership factor includes, among other variables, percent of outstanding stock owned by blockholders and insider ownership. The compensation factor includes real option value, exercisable option value, and proportion of equity-based compensation. I used variables with the largest principal components in each factor in Model 4 of Table VII. Specifically, the model is:

$$\Pr(y = 1) = \Pr\left[\begin{array}{l} \alpha_1 + \alpha_2 \text{PCHELDINS} + \alpha_3 \ln(\text{FIRMSIZE}) \\ +\alpha_4 \ln(\text{TOTCOMP}) + \upsilon > 0 \end{array}\right]$$

Here, TOTCOMP represents the total CEO compensation. Although these variables were highly correlated with the underlying factor, only firm size is significant in the model. Higher total assets indicate higher probabilities of SOX compliance. The proportion of shares held by insiders and total CEO compensation are not significant in the model. Overall, the model is significant at the 5 per cent level[8].

Analysis of the four models used to predict SOX Section 404 compliance gives rise to several conclusions. First, it appears that firm size is a significant determinant of SOX compliance and is robust to various specifications. Larger firms are more likely to be SOX compliant. Second, certain governance characteristics tend to explain SOX compliance likelihood more than others. In Models 2 and 3, several board variables, including board size and proportion of directors with at least 15 years tenure, are significant determinants of SOX compliance. This result is consistent with that found in the univariate analyzes in Table IV. However, corporate governance structure appears to have less of an impact on SOX Section 404 compliance than firm size, which is a major determinant.

5. Conclusions

This study analyzes characteristics from a corporate governance perspective between firms deemed in compliance with SOX Section 404 and firms violating SOX Section 404. Here, I analyze 10-Q reports from the second quarter of 2005 to create

the sample of firms. First, I studied corporate governance and financial characteristics of Section 404 compliance and violator firms in a univariate setting. Then, I studied whether it is possible to predict SOX status based on corporate governance and financial characteristics. Theory would suggest that firms with stronger corporate governance are more likely to be in compliance with Section 404 of SOX, as this section of the act deals with governance control and monitoring capabilities. However, although I found several significant differences and determinants between samples, governance characteristics do not contribute to SOX status as much as theory would predict.

Using a large array of governance variables, I found that firms in violation of Section 404 tend to be more closely held than other firms. Also, analysis of board characteristics leads to the conclusion that there is an overwhelming similarity between the different SOX compliance status groups. However, I found that board size is larger on compliance firm boards and there are more experienced directors on compliance boards than on violator boards. Further, CEO compensation level and structure are remarkably similar between groups. In general, compliance CEOs command higher salaries and bonuses and tend to have more in terms of exercisable options than their counterparts from other firms, but equity-based pay as a proportion of total compensation is not statistically significantly different between samples.

There is a difference between SOX status groups in terms of financial characteristics. In general, compliance firms are larger than violators. This supports mounting anecdotal evidence that larger firms may have an easier time complying with SOX than other firms. However, violator firms are not weak financially.

I examined the determinants of a firm being compliant with Section 404 using four different logistic models. Overall, the results suggest that size is a strong factor in predicting SOX compliance. Larger firms are more likely to be in compliance with SOX than smaller firms. This result is robust to a variety of specifications. In addition, several governance variables seem to aid in predicting SOX compliance. Specifically, proportion of directors with long tenures on the board, audit fees as a percentage of total CEO compensation, and proportion of cash-based compensation out of total CEO compensation are associated with a likelihood of SOX compliance, although this last relationship is not in the hypothesized direction.

The results of this study lead to important questions for both policymakers and academics. It is worthwhile to encourage good corporate governance at public and private firms alike. However, the current laws do not seem to encourage what is commonly considered to be good corporate governance characteristics. Instead, only large firms that are capable of paying for the increased auditing costs are able to comply with SOX. In fact, some corporate governance variables are statistically significant in the multivariate models indicating they are determinants of SOX compliance, but some characteristics – such as proportion of outsiders on the board and equity-based compensation – are not as significant as expected. In effect, SOX violators are not systematically worse when it comes to corporate governance. In fact, their structure is remarkably similar to firms in compliance with Section 404. Therefore, further research is warranted into what really entails good corporate governance and whether policies instilled to promote good corporate governance are actually doing so.

Notes

1. Although tests for difference between the groups in terms of insider holdings are ambiguous, I report results for comprehensiveness and distribution identification purposes.

2. http://www.aflcio.org/corporatewatch/paywatch/pay/

3. I also collected firms from concerns-raised and non-compliance categories of SOX 404 compliance. Firms that are in the status of SOX-concerns-raised include those firms that are nearly compliant but must, for example, work to streamline or automate the financial process or improve communications between departments. Non-compliance indicates the firm must provide more improvements in internal controls and financial reporting. Otherwise, the firm may be in violation of SOX. However, concerns-raised and non-compliance firms are not used in the final analysis due to small sample size.

4. A comparison between the all compliance firms and the compliance sample reveals no statistically significant difference in terms of net sales, total assets, and capital expenditures. For all compliance firms, average total assets are $14,278M, net sales are $6,012M, and capital expenditures are $348M.

5. Further, I excluded the firms with total assets in the top fifth percentile from each group to control for any outliers that may be driving the results. I found that compliance firms have higher average total assets than violator firms in this reduced sample but this difference is not statistically significant. Compliance firms also have statistically significantly larger PPE and net sales (consistent with results in Table VI) than violator firms.

6. I also tested for differences between compliance and violation firms in terms of stock exchange, auditor, and industry. Although I found no evidence of Section 404 status being related to particular exchanges, audit firms, or industries, I used these variables as fixed-effect controls in robustness checks of the following logistic analysis.

7. This percent is calculated by using the coefficient (-0.576) of audit fees/total CEO compensation: $\exp(-0.576)/(1+\exp(-0.576))$.

8. As a robustness check, I also included leverage (total debt/total assets) in each model of Table VII. In Model 1 the coefficient on leverage is negative and significant at the 10 percent level, and in Models 2-4 it is not significant. Leverage does not change the overall results for any model presented in Table VII.

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About the author

Elizabeth Webb, PhD, is a Supervisory Financial Analyst in the Supervision, Regulation, and Credit Department at the Federal Reserve Bank of Philadelphia. Elizabeth received her PhD in Finance at Drexel University in 2003. Elizabeth Webb is the corresponding author and can be contacted at: elizabeth.webb@phil.frb.org

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