The Impact of Independent and Overlapping Board Structures on CEO Compensation, Pay-Performance Sensitivity and Accruals Management

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Due to SOX, new rules that require independent directors on corporate boards and committees are likely to result in overlapping board structure (directors serving on more than one committee). The purpose of this study is to examine the effects of independent and overlapping board structures on CEO compensation, CEO pay-performance sensitivity, and accruals management. Our results support Laux and Laux (2009) that overlapping compensation committees take conservative actions by granting CEOs less equity-based compensation to reduce monitoring cost of financial reporting. However, we do not find that overlapping compensation committees have any effect on CEO pay-performance sensitivity. Furthermore, our results show that SOX might reduce CEOs' risk taking because independent compensation committees grant CEOs more cash-based and less equity-based compensation after SOX. In addition, although SOX improves the independent audit committee's oversight functions, our findings support Laux and Laux (2009) that overlapping audit committees have an association with accruals management.

Introduction

In the wake of corporate financial scandals, the Sarbanes-Oxley Act (SOX) and the Securities Exchange Commission (SEC) require a majority of independent directors and a fully independent audit committee to ensure the quality of financial

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reporting.[1] The New York Securities Exchange (NYSE) and the National Association of Securities Dealers Automated Quotations (NASDAQ) also require compensation and nominating committees to be comprised of independent directors after 2004.[2] With a limited pool of qualified independent directors available, finding qualified board and committee members becomes a challenge for many companies. As a result, there is an increase in the overlapping of corporate boards. That is, directors serve on multiple committees.

A recent theoretical study by Laux and Laux (2009) suggests that director overlapping leads to a less effective CEO compensation package and decreases the effectiveness of board oversight of financial reporting. Several empirical studies have examined the associations of overlapping board structure with CEO compensation and earnings management. For example, Zheng and Cullinan (2010) examine the association between director overlapping and incentive-based compensation and find that firms with an overlapping board structure have an association with less incentive pay for CEOs. Hoitash and Hoitash (2009) examine the association between the number of audit and compensation committee overlaps with the ratio of CEO base salary to total annual cash compensation. They find a positive relation and suggest that overlapping members tend to advocate for less incentive pay that, in turn, leads to lower earnings manipulation risk from the CEOs. Chandar, Chang, and Zheng (2008) investigate whether audit committee members are better monitors if they are also on the compensation committee. They find that firms with overlapping audit and compensation committees have higher financial reporting quality.

Previous empirical studies have not examined the association between an overlapping board structure and CEO pay-performance sensitivity, and the effects of SOX on an overlapping board structure in monitoring CEO compensation and earnings management. Motivated by the phenomenon of increasing director overlapping after SOX, this study intends to fill this gap by empirically testing the propositions of Laux and Laux (2009). Unlike previous studies, we investigate whether the oversight effectiveness of an overlapping board structure has an association with the level and composition of CEO compensation, the sensitivity of CEO pay-performance, and accruals management. We also examine the difference in this effect between the pre-SOX and post-SOX periods.

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[1] Refers to the Securities and Exchange Commission Standards relating to listed companies' audit committees, 17 CFR parts 228, 229, 240, 249 and 274; Release Nos. 33-8220; 34-47654; IC-26001; File No.S7-02-03. Under the SEC's new definition, small firms are firms whose revenues are less than $25 million. The definitions of a fully independent audit committee also refer to Section 303(A) (2) (a) and (3) of the New York Securities Exchange, NASD Rule 4200 and Rule 4350 (d) of the National Association of Securities Dealers, and Rule 121(A) of the American Stock Exchange.

[2] Refers to Section 303 (A) (4) (5) of the New York Securities Exchange and Rule 4350 (c) of the National Association of Securities Dealers.

This study contributes to the current literature from several perspectives. First, our findings support the proposition of Laux and Laux (2009) that companies with overlapping compensation committees (audit committee members also sitting on the compensation committee) take conservative actions by awarding CEOs less equity-based compensation to reduce their monitoring costs. In contrast, we find no evidence to support the proposition of Laux and Laux (2009) that overlapping compensation committees affect CEO pay-performance sensitivity. Nonetheless, we find that companies with overlapping audit committees (compensation committee members also sitting on the auditing committee) have a positive association with discretionary accruals, which supports the proposition of Laux and Laux (2009) that an overlapping board reduces oversight effectiveness in accruals management.

Second, this study provides evidence consistent with the implication that SOX reduces directors' risk taking due to increased liabilities in monitoring financial reporting. We find that independent directors on compensation committees decrease the equity-based compensation and increase the cash-based compensation to CEOs after SOX. Furthermore, overlapping compensation committees grant a smaller percentage of equity-based compensation to CEOs in the post-SOX period, which suggests that overlapping independent directors take conservative actions in rewarding CEOs after SOX. Also, consistent with Chang and Sun (2009; 2010), our results show that compared with the pre-SOX period, independent audit committees are more effective in monitoring accruals management in the post-SOX period.

Third, we reexamine the oversight effectiveness of board and committee independence in CEO compensation and accruals management. We find that when board independence and compensation committee independence have an association with a high percentage of incentive-based compensation, neither of them is sufficient to curb the level of CEO compensation. On the contrary, although directors on audit committees do not make direct decisions on CEO compensation, our findings suggest that they voice against lucrative CEO compensation because of the high monitoring cost associated with high incentive-based compensation.

Lastly, this study provides evidence on the role of CEOs in CEO compensation and accruals management. We find that, in general, CEOs receive more compensation by sitting on nominating committees. We do not find that CEOs sitting on compensation committees receive higher compensation. In contrast, we find that CEOs serving as the chairman of the board receive more equity-based compensation; however, the equity-based compensation is not related to firm performance. We do not find a significant association between CEOs sitting on nominating/compensation committees and discretionary accruals. Also, we find no association between duality/ownership of CEOs and discretionary accruals.

The remainder of this paper is organized as follows. Section 2 reviews the literature and discusses research questions. Section 3 describes the sample, data, and method. Section 4 presents the empirical results. Section 5 concludes the findings.

Literature Review and Research Questions

In modern corporations, committees carry out most board functions. A nominating committee selects highly qualified directors to form an appropriate board; an audit committee monitors the credibility of financial reporting; and a compensation committee creates incentives for the CEO to increase shareholders' wealth. After the recent financial scandals, SOX has directed companies to have more independent directors on their boards that has consequently resulted in more overlapping of directors on board committees. By examining the effects of independent and overlapping board structures on the level and composition of CEO compensation, CEO pay-performance sensitivity, and accruals management, this study intends to answer the following three research questions (RQs).

RQ1: Does an Overlapping Board Structure Affect the Board's Oversight Effectiveness when Contracting CEO Compensation and Monitoring Accruals Management?

The common wisdom believes that the separation of board functions between subcommittees improves board effectiveness in modern corporations. Therefore, companies with a separation of board functions have compensation committees contracting CEO compensation with greater pay-performance sensitivity, and audit committees executing better oversight over financial reporting (Laux and Laux, 2009). On the other hand, because greater pay-performance sensitivity encourages more earnings management, there is an additional monitoring cost for audit committee members.

An overlapping board structure can affect the effectiveness of a board's oversight over CEO compensation with greater pay-performance sensitivity. Theoretically, without a separation of board functions, board members will take conservative actions by awarding CEOs more cash-based compensation to reduce monitoring costs (Laux and Laux, 2009). However, this conservative monitoring function at the board level fails to provide CEOs an incentive to improve firm performance. Because directors of boards prevalently focus more on monitoring functions than strategies or the protection of shareholders' interests (Adams, 2003), audit committees will favor CEO compensation with low pay-performance sensitivity. As a result, audit committee members sitting on compensation committees will award CEOs with less incentive-based compensation. Scaling back on pay-performance sensitivity, nonetheless, imposes other costs to companies – namely, the reputational cost to the boards and the cost of discouraging CEOs' risk taking.

Overlapping board structure can also affect the board's oversight effectiveness in monitoring financial reporting. An overlapping compensation committee member might act laxly on the audit committee because of his or her association with the CEO in various professional and social contexts that result in the member's

appointment to the committee. Guedj and Barnea (2009) find evidence that companies whose directors are well-connected have higher CEO compensation and that compensation is less sensitive to firm performance. Moreover, they find that well-connected directors are more likely to be awarded more directorships and to act mutedly when overseeing CEOs because they feel that their status in the network is secure. But, directors who are not well-connected build their reputation by providing superior monitoring.

In spite of the negative effects associated with an overlapping board structure, there are potential benefits from overlapping committee membership, mainly through improved communications among board committees. Because subcommittees of the board are responsible for making decisions, directors have to gather all necessary information in order to make informed and reasonable decisions for the individual committees. In some areas, one committee's responsibilities might overlap with the responsibilities of other committees. For example, one committee might need to coordinate with other committees for the financial metrics selection and evaluation used in determining executive incentive compensation, director selection and evaluation for board committee appointments, oversight of legal compliance, and review of the Compensation Discussion and Analysis. Therefore, to fulfill the board's oversight obligations, one board committee needs to obtain necessary information from other committees. As overlapping board structure facilitates and improves communications among committees, this information sharing among board committees should improve board oversight mechanisms. Along these lines, an overlapping board structure might not necessarily result in lower pay-performance sensitivity or financial reporting quality as suggested by Laux and Laux (2009).

This study intends to provide empirical evidence to answer the question whether an overlapping board structure weakens the oversight function of audit and compensation committees.

RQ2: Do Board Independence and Committee Independence Improve their Oversight Effectiveness when Contracting CEO Compensation and Monitoring Accruals Management?

Board independence, committee independence, CEO compensation, and earnings management have been highly debated issues in the last decade. Some studies suggest that CEOs might influence compensation contracts by manipulating compensation committees (e.g., Main, O'Reilly, and Wade, 1995; Newman and Mozes, 1999). This manipulation can occur in the following three situations: (1) when the CEO is linked to the directors serving on the compensation committee, or when the inside and outside directors are linked among themselves (Larcker, Richardson, Seary, and Tuna, 2005), (2) when directors are socially and professionally well-connected (Guedj and Barnea, 2009), and (3) when the CEO is involved in the nomination of new directors (Core, Holthausen, and Larcker, 1999).

Other studies find no evidence that the presence of insiders on compensation committee affects CEO compensation. For example, Anderson and Bizjak (2003) find that the presence of insiders or CEOs on compensation committees does not result in opportunistic behaviors or different incentive contracts. However, they find that a compensation committee with a higher proportion of outsiders has an association with less fixed, but more incentive-based, CEO compensation. Conyon and He (2004) also find no evidence that the presence of insiders serving on the compensation committee results in higher CEO compensation, but they do find that compensation committee members with higher share stakes have an association with lower CEO compensation and higher equity incentives in IPO firms. Furthermore, Bhagat and Black (2002) provide empirical evidence to challenge the conventional wisdom that companies with more independent boards perform better than other companies, suggesting that inside directors play valuable roles that might be lost in a single-minded drive for greater board independence.

Prior studies have found a negative relation between independent audit committees and earnings management through the use of various measures of audit committee independence. For example, Menon and Williams (1994) find that when the proportion of outside directors increases, companies are more likely to exclude insiders from audit committees, and the audit committees then become more active. Klein (2002) finds that companies with a majority of independent directors on their audit committees experience less accruals management. Similarly, Bedard, Chtourou, and Courteau (2004) find lower earnings management in companies with fully independent audit committees. Furthermore, Chang and Sun (2009; 2010) report a negative association between earnings management and audit committee independence in the post-SOX period.

While previous studies have investigated the associations of independent board structure with CEO compensation and earnings management, the results are inconsistent. Therefore, we reexamine the issue of whether director independence is essential to corporate governance functions in conjunction with the effects of the new SOX regulations. If so, an independent compensation committee will align CEO compensation with firm performance. Also, an independent audit committee will discourage accruals management misbehavior.

RQ3: What is the Implication of SOX on the Oversight Effectiveness of Corporate Boards when Contracting CEO Compensation and Monitoring Accruals Management?

Several studies have examined the effect of SOX on CEO compensation. Chhaochharia and Grinstein (2009) find that board independence rather than committee independence has an association with the reduction of CEO compensation after SOX, and the reduction mainly comes from a decrease in incentive-based compensation. Dicks (2009) theoretically models the relation between incentive

compensation and governance. He argues that when companies are forced to raise the level of governance, they lower incentive pay to CEOs. Cohen, Dey, and Lys (2009) investigate the effect of SOX on incentive pay to CEOs and find that SOX has a significant association with a reduction in CEOs' risk taking, especially in companies with less independent directors in the pre-SOX period.

The effect of SOX on earnings management has been addressed in several studies. Cohen et al. (2008) provide evidence to show that the increases in accrual-based earnings management have an association with the increase in equity-based CEO compensation prior to SOX. They further document that new granted options have a negative association with income-increasing accrual-based earnings management, and unexercised options have a positive association with income-increasing accrual-based earnings management. Carter, Lynch, and Zechman (2008) find that, prior to SOX, bonus-contracts reward income increasing-discretionary accruals and do not penalize income-decreasing discretionary accruals. They also find that the premium for income-increasing accruals disappears after SOX and a penalty for income-decreasing discretionary accruals is imposed. They further demonstrate that the changes in bonus compensation structure have an association with changes in earnings management, which is consistent with the lack of reward for earnings management.

We extend prior research by investigating the effects of an overlapping board structure on CEO pay-performance sensitivity, the level of CEO compensation, and discretionary accruals in both the pre- and post-SOX periods.

Data, Method, Variable Definitions, and Descriptive Statistics Sample

To investigate the effect of SOX regulations on the overlapping board structure, we select our sample from 1999 to 2004[3] but exclude all financial and utility industries. The executive compensation, director, and financial data come from ExecuComp, RiskMetrics (IRRC, previously), and Compustat. Initially, there are 5,934 firm-year observations available in the sample period. We delete companies without CEO compensation or stock price data for the measures of the sensitivity of CEO compensation. As a result, the sample size reduces to 4,949 firm-year observations. The sample further reduces to 4,355 firm-year observations after deleting companies that have no data for the measure of discretionary accruals. We then divide our sample into two periods: the pre-SOX period from 1999 to 2001 and the post-SOX period from 2002 to 2004.

[3] Although the national markets require firms to have fully independent directors on audit, compensation, and nominating committees by 2004, many firms complied with the requirements when SOX was effective in 2002.

Measures of CEO Compensation

In this study, we employ three different measures of CEO compensation. These three measures are: cash-based compensation (TCC = salary + bonus), total compensation (TDC= salary+ bonuses+ options+ restricted stocks + other compensation), and equity-based compensation (STKOPT), which is TDC minus TCC. Panel A in Table 1 provides the descriptive statistics for these three compensation measures[4] during the sample period, and Appendix A summarizes the details of each variable definition.

Panel A of Table 1 shows that the cash-based CEO compensation (TCC) is stable prior to SOX but increases steadily after SOX. The average TCC, STKOPT, and TDC are $1,407,000, $3,026,000, and $4,486,000 respectively. The Wilcoxon tests show a significant increase in the total CEO compensation after SOX, and cash-based compensation is the main driver behind this increase.

Measures of CEO Pay-Performance Sensitivity

Core and Guay (2002) propose the use of the change in option portfolio value for every 1% change in the stock price as the measure of CEO pay-performance sensitivity. We adopt this approach and calculate the dollar change in TCC, TDC, and STKOPT as proxies for the sensitivity of CEO pay-performance.

Panel B of Table 1 provides the descriptive statistics for the changes in CEO compensation and CEO pay-performance sensitivity measures. The average dollar increase in cash-based compensation (ChgTCC) is $112,390. The average changes in equity-based compensation (ChgSTK) and total compensation (ChgTDC) are $70,840 and −$26,680 respectively. In particular, both the equity-based and total compensations show a significant decrease from 2001 to 2003. Furthermore, the sensitivity of cash-based pay-performance (TCC_PFRM) is 0.09%, which indicates that the stock price increases 0.09% for every $1,000 increase in cash-based compensation, on average. The equity-based pay-performance sensitivity (STK_PFRM) is 0.01%, and the total pay-performance sensitivity (TDC_PFRM) is 0.02% respectively. The average percentage change in stock price (ChgPR) during the sample period is 14.46% with some fluctuations from year to year.

[4] We also employ compensation data that is adjusted by the relevant consumer price index in 2004 to test the robustness of our regression results. The results are qualitatively similar to the results from using unadjusted compensation data in Execucomp.

Table 1 – Descriptive Statistics of CEO Compensation, Sensitivity of Pay-Performance and Board Composition Variables

Panel A Mean of CEO Compensation

Variable	1999	2000	2001	2002	2003	2004	Pooling	Pre-SOX	Post-SOX	Wilcoxon Test
TCC	1,284	1,322	1,209	1,322	1,513	1,749	1,407	1,269	1,527	7.43***
STKOPT	2,784	3,055	3,406	3,008	2,721	3,180	3,026	3,097	2,965	−0.68
TDC	4,110	4,421	4,662	4,384	4,300	4,994	4,486	4,411	4,553	2.60***
PCT_TCC	49.7%	49.2%	45.4%	47.3%	50.1%	48.2%	48.3%	48.0%	48.5%	0.98
PCT_STK	49.0%	49.5%	53.1%	51.4%	48.4%	50.5%	50.3%	50.7%	50.0%	−1.12
N	721	752	830	873	915	858	4,949	2,303	2,646	

TCC is comprised of salary and bonus (in thousands of US dollars). Total compensation (TDC, in thousands of US dollars) is the sum of salary, bonus, options, restricted stocks, and the total value of stock options granted, long-term incentive payouts, and all other compensation (ExecuComp data item TDC1). STKOPT is TDC minus TCC and all other compensation (ExecuComp data item OTHANN). PCT_TCC is the average percentage of TCC divided by TDC, and PCT_STK is the average percentage of STKOPT divided by TDC. The Wilcoxon tests are mean tested for two periods: pre-SOX (1999-2001) versus post-SOX (2002-2004). The *, ** and *** represent the p-values less than 0.10, 0.05 and 0.01 respectively.

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Table 1 (continued) – Descriptive Statistics of CEO Compensation, Sensitivity of Pay-Performance and Board Composition Variables

Panel B Pay-Perform Variables

Variables	1999	2000	2001	2002	2003	2004	Pooling	Pre-SOX	Post-SOX	Wilcoxon Test
ChgPR (%)	20.58	12.81	12.66	−13.50	41.20	18.08	14.46	15.19	15.65	6.38***
ChgTCC	115.26	98.95	−110.92	104.35	161.61	230.28	112.39	28.42	164.98	7.45***
ChgSTK	262.87	251.79	−833.77	−1,060.50	−639.77	465.53	70.84	−135.98	−420.17	−4.34***
ChgTDC	137.40	150.45	−704.56	−1,153.42	−792.27	263.91	−26.68	−161.78	−568.94	−1.80*
TCC_ PFRM (%)	0.10	0.13	0.06	0.07	0.12	0.05	0.09	0.10	0.08	−0.22
STK_ PFRM (%)	−0.02	0.02	−0.01	−0.01	−0.03	0.10	0.01	0.01	0.02	0.93
TDC_ PFRM (%)	0.04	0.01	−0.05	0.01	0.06	0.06	0.02	−0.01	0.04	2.19**
N	721	752	830	873	915	858	4,949	2,303	2,646	

ChgPR is the percentage change in stock price. ChgTCC is the change in cash-based compensation (in thousands of US dollars). ChgSTK is the change in equity-based compensation (in thousands of US dollars), and ChgTDC is the change in annual total compensation (in thousands of US dollars). TCC_PFRM is the sensitivity of CEO cash compensation in response to the change in stock price, which is the change in stock price scaled by the change in TCC. STK_PFRM is the sensitivity to change in equity-based compensation in response to the change in stock price. That is, the change in stock price scaled by the change in the value of equity-based compensation. TDC_PFRM is the sensitivity to total compensation in response to the change in stock price, which is the change in stock price scaled by the change in total compensation. The Wilcoxon tests are mean tested for two periods: pre-SOX (1999-2001) versus post-SOX (2002-2004). The *, ** and *** represent p-values less than 0.10, 0.05 and 0.01 respectively.

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Table 1 (continued) – Descriptive Statistics of CEO Compensation, Sensitivity of Pay-Performance and Board Composition Variables

Panel C Mean of Board Composition

Variables	1999	2000	2001	2002	2003	2004	Pooling	Pre-SOX	Post-SOX	Wilcoxon tests
BRDSIZE	9.13	8.94	8.73	9.03	9.06	9.09	9.00	8.92	9.06	2.64***
AUDSIZE	3.54	3.50	3.51	3.67	3.68	3.68	3.60	3.51	3.67	6.23***
COMPSIZE	3.38	3.36	3.39	3.49	3.54	3.54	3.44	3.38	3.49	3.06***
BRDIND (%)	60.88	63.08	65.48	65.53	67.64	70.38	65.71	63.26	67.84	8.23***
AUDIND (%)	81.79	85.93	88.66	89.90	91.93	94.52	89.09	85.62	92.10	10.68***
COMPIND (%)	85.34	87.21	87.94	88.96	90.92	92.93	89.05	86.89	90.93	5.73***
OVLP_ AUDCOMP	1.24	1.30	1.33	1.42	1.41	1.39	1.35	1.29	1.40	3.89***
AUDCOMP (%)	35.30	37.57	38.97	40.53	40.49	38.49	38.69	37.36	39.85	3.10***
COMPAUD (%)	34.83	36.32	37.60	38.35	38.07	37.26	37.16	36.32	37.90	2.28**
CEO_NOM (%)	43.27	44.68	41.59	43.64	41.20	43.27	42.89	43.12	42.68	−0.32
CEO_COMP (%)	55.20	52.79	55.53	51.20	46.99	47.33	51.30	54.53	48.49	−4.24***
CHRCEO (%)	61.03	59.97	55.77	65.64	64.70	63.46	61.90	58.79	64.60	4.21***
CEOSHARE (%)	3.01	2.76	2.46	2.33	2.19	2.11	2.45	2.73	2.21	−0.21
DIRAGE	58.98	58.90	58.69	58.98	59.22	59.40	59.04	58.85	59.20	2.34**
DIRTENURE	11.07	10.86	10.13	10.55	10.52	10.40	10.57	10.66	10.49	−1.99**
N	721	752	830	873	915	858	4,949			

The board composition data are obtained from RiskMetrics (the Investor Responsibility Research Center, IRRC, previously). The Wilcoxon tests are mean tested for two periods: pre-SOX (1999-2001) versus post-SOX (2002-2004). The *, ** and *** represent p-values less than 0.10, 0.05 and 0.01 respectively.

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Measure of Discretionary Accruals

Prior studies have used the Jones model (Jones, 1991) and the modified Jones model (Dechow, Sloan and Sweeney, 1995) to measure discretionary accruals. Kothari, Leone, and Wasley (2005) criticize prior studies for the problematical heteroskedasticity and the mis-specification issues associated with the measure of discretionary accruals. They propose a model that includes an intercept and a lagged ROA (return on assets) to mitigate the econometric problems in estimating discretionary accruals. We adopt Kothari et al.'s (2005) model as follows:

$$TACC_t = a_0 + a_1(1/TA_{t-1}) + a_2\Delta REV_t + a_3 PPE_t + a_4 ROA_{t-1} + \varepsilon_t \quad (1)$$

TACC is total accruals equal to (ΔCurrent Assets −ΔCash −ΔCurrent Liability +ΔCurrent Portion of Long-term Debt – Depreciation& Amortization). ΔREV is net change in sales (ΔSales) minuses the change in account receivables (ΔAR), and PPE is net property, plant, and equipment. These variables are all scaled by lagged total assets (TA). We use the lagged return on assets (ROA) to control for the firm performance effect. The residuals from the model are a firm-level measure of discretionary accruals where higher discretionary accruals indicate higher earnings management or lower accruals quality. The nontabulated descriptive statistics show that the average discretionary accruals (DACC) are 0.002, and the DACC (0.008) in the pre-SOX period is significantly larger than the DACC (−0.003) in the post-SOX period.

Measures of Board and Committee Independence and the Overlapping Board Structure

We measure the overlapping committee structure by the proportion of independent overlapping directors sitting on two committees. The RiskMetrics database classifies directors into three types: independent, employee, and linked directors. Therefore, we dichotomize a director as independent based on its classification.

Panel C of Table 1 presents the descriptive statistics of board composition. The average board size (BRDSIZE) is 9.00. The average number of audit (AUDSIZE) and compensation (COMPSIZE) committee members are 3.60 and 3.44 respectively. The Wilcoxon signed-tests show that the average size of both audit and compensation committees increases significantly after SOX. Moreover, the mean percentage of independent directors of boards (BRDIND) is 65.71%. The mean percentages of independent directors on the audit (AUDIND) and compensation committees (COMPIND) are 89.09% and 89.05% respectively. The percentage of independent directors on boards (BRDIND), audit (AUDIND), and compensation (COMPIND) committees increases significantly after SOX.

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Furthermore, Panel C of Table 1 shows that the mean number of independent directors sitting on both audit and compensation committees (OVLP_AUDCOMP) is 1.35, which increases significantly after SOX. The percentage of independent audit committee members sitting on compensation committees (AUDCOMP) is 38.69%, and the percentage of independent compensation committee members sitting on audit committees (COMPAUD) is 37.16%, on average. Both AUDCOMP (37.36% vs. 39.85%) and COMPAUD (36.32% vs. 37.90%) show significant increases after SOX.

Measures of Other Governance Control Variables and Economic Control Variables

Recent regulations have induced a number of changes in governance to mitigate CEOs' influence over boards and committees and increase the CEOs' liability from financial reporting and internal control. We use several variables, CEO_NOM, CEO_COMP, CHRCEO, CEOSHARE, DIRAGE and DIRTENURE, to control for the regulations' effect on CEO compensation and accruals management. The CEO_COMP (CEO_NOM) is a dummy variable that takes the value of one if a CEO also sits on the compensation (nominating) committee, otherwise it is zero. In Panel C of Table 1, the average CEO_NOM is 42.89% and the average CEO_COMP is 51.30%, but CEO_COMP significantly decreases after SOX and CEO_NOM does not show a significant change. The dummy variable for dual-role CEOs (CHRCEO) is equal to one if a CEO also serves as the chairman of board and its average is 61.90%. The average ownership of CEOs (CEOSHARE) is 2.45%. Also, the average age (DIRAGE) and the average tenure of directors (DIRTENURE) are 59.04 and 10.57 years, respectively.

A board's composition can affect its firm's performance; in turn, the firm's performance can affect the board's future composition (Bhagat and Black, 2002). We include several economic variables as control variables for firm performance. Specifically, we use the market value of the firm's equity (LNMV) to control for firm size, the average year-end, market-to-book value over the past five years (INVTOPP) as the proxy for investment opportunities, and the standard deviation of annual market returns (RETSTD) over the past five years to control for market variability. We also use return on assets (ROA), market-to-book (MTB) and annual market returns (RETURN) to control for contemporary firm growth in the relation between CEO compensation and firm performance. Furthermore, we use total debt over average total assets (LEVERAGE) as the control variable for CEOs' pressure from potential debt covenant constraints in managing earnings. In addition, we use Fama and French's (1997) forty-eight-industry dummy variables as the fixed effect (industry FE) to control for the industry differences in CEO compensation, and year-dummy variables (Year FE) to control for the year differences in CEO compensation and accruals management.

Empirical Results

Table 2 reports the Pearson correlations between the board composition variables and the sensitivity of CEO compensation variables. The table shows that board independence (BRDIND) and compensation committee independence (COMPIND) are significant and positive to the correlation with the equity-based CEO pay-performance sensitivity (STK_PRFM). These positive correlations suggest that board independence and compensation committee independence are effective oversight mechanisms when contracting CEO compensation to align with firm performance.

Table 2 – Pearson Correlations

	COM-PIND	AUD-IND	AUD-COMP	AUD-COMP_SOX	TCC_PRFM	STK_PRFM	TDC_PRFM
BRD-IND	0.522***	0.567***	−0.157***	−0.030**	−0.022	0.052***	0.007
COMP-IND		0.404***	0.244***	0.166***	0.001	0.051***	0.014
AUD-IND			0.201***	0.177***	−0.011	0.018	−0.001
AUD-COMP				0.576***	0.025*	−0.011	−0.012
AUD-COMP_SOX					0.005	−0.004	−0.010

The definitions of variables are as previously defined in Appendix A. The *, **, and *** represent significance levels at less than 0.10, 0.05 and 0.01 respectively.

Effect of an Overlapping Board Structure on CEO Compensation

We first examine the effect of an overlapping board structure on CEO compensation conditioned on other board composition and control variables.[1] Both the level and percentage of CEO compensation are used as dependent variables, and Table 3 presents the results.[2] The three measures of the level of CEO compensation

[1] Our regressions include a large number of variables that might raise a concern about multicollinearity. Therefore, we check each regression model by running the variance inflation factor (VIF) test. Our test results show that all VIFs of the variables in the regression models are less than 3.0, which does not indicate a cause for concern about multicollinearity.

[2] The CEO compensation in the succession year might be problematical when there is a change in CEO in that year because the successor CEO might only serve a partial year. Also

are the natural log of cash-based compensation (LNTCC), the equity-based compensation (LNSTK), and the total compensation (LNTDC). The two measures of the percentage of CEO compensation are the percentage of cash-based compensation (PCT_TCC) scaled by total compensation and the percentage of equity-based compensation (PCT_STK) scaled by total compensation.

We find that the percentage of overlapping audit committee members sitting on compensation committees (AUDCOMP) has a negative and significant association with the percentage of equity-based compensation (PCT_STK, t= −1.84), as well as all three measures of the level of CEO compensation (LNTCC, t= −3.64; LNSTK, t= −3.36; and LNTDC, t= −2.12 respectively). These results suggest that when independent directors sit on both audit and compensation committees and carry out two duties that monitor both CEO compensation and financial reporting quality, they take conservative actions by granting CEOs less compensation. That is, the overlapping directors prefer not to overpay CEOs; especially, they prefer reducing incentive-based compensation for CEOs. These results support the proposition of Laux and Laux (2009) that overlapping compensation committees take conservative actions by awarding CEOs less incentive-based compensation.

if the successor was an executive of the company before becoming CEO, the successor's annual pay might be mixed in with the CEO pay. Therefore, we run robustness tests that delete CEO compensation in the succession year if the CEO did not serve a whole year term. We find that these results are qualitatively similar to the reported results in Tables 3 to 6. More importantly, the deletion of the CEO compensation in the succession years does not alter the significance of the reported statistics in Tables 3 through 6.

Table 3 – Regressions of the level of CEO Compensation on Overlapping Board Composition and Control Variables n=4,949

Variables	LNTCC	PCT_TCC	LNSTK	PCT_STK	LNTDC
Intercept	0.645	0.182	−1.064	0.463	2.369
	(1.25)	(0.75)	(−0.53)	(1.83*)	(3.24***)
BRDSIZE	0.017	0.005	0.019	−0.003	0.003
	(4.66***)	(2.90***)	(1.32)	(−1.41)	(0.58)
AUDCOMP	−0.103	0.001	−0.373	−0.026	−0.086
	(−3.64***)	(0.02)	(−3.36***)	(−1.84*)	(−2.12***)
AUDCOMP*SOX	0.178	0.035	0.064	−0.022	0.034
	(6.09***)	(2.50**)	(0.56)	(−1.74*)	(0.82)
CEO_NOM	0.062	−0.021	0.198	0.020	0.083
	(3.74***)	(−2.71***)	(3.07***)	(2.41**)	(3.51***)
CEO_COMP	−0.037	−0.002	0.062	0.011	−0.026
	(−2.29**)	(−0.26)	(0.98)	(1.37)	(−1.12)
CHRCEO	0.134	−0.023	0.263	0.020	0.193
	(8.61***)	(−3.17***)	(4.33***)	(2.62***)	(8.74***)
CEOSHARE	−0.010	0.007	−0.078	−0.008	−0.024
	(−7.81***)	(11.88***)	(−16.09***)	(−13.91***)	(−13.47***)
LNAGE	1.148	0.142	1.141	−0.055	0.728
	(8.75***)	(2.28**)	(2.24**)	(−0.85)	(3.92***)
LNTENURE	−0.180	0.069	−0.574	−0.070	−0.328
	(−7.09***)	(5.72***)	(−5.83***)	(−5.65***)	(−9.12***)
LNMV	0.249	−0.059	0.541	0.054	0.413
	(42.70***)	(−21.56***)	(23.79***)	(18.81***)	(49.77***)
ROA	0.346	0.124	−0.208	−0.092	−0.113
	(6.57***)	(4.81***)	(−1.01)	(−3.13***)	(−1.50)
MTB	−0.001	0.001	−0.001	−0.001	−0.001
	(−1.64*)	(0.13)	(−0.39)	(−0.15)	(−1.36)
RETURN	0.002	−0.001	0.003	0.001	0.002
	(17.22***)	(−0.35)	(4.97***)	(0.16)	(11.68***)
INVTOPP	−0.007	−0.001	−0.005	0.001	−0.004
	(−6.00***)	(−0.85)	(−1.02)	(0.99)	(−2.54**)
RETSTD	−0.001	−0.001	0.001	0.001	0.001
	(−5.63***)	(−5.32***)	(0.92)	(4.09***)	(2.44**)
Industry FE	Yes	Yes	Yes	Yes	Yes
R^2-adj	47.69%	22.64%	26.11%	20.54%	50.28%
F	93.05***	30.51***	37.00***	27.33***	103.11***

LNTCC is the natural log value of TCC, LNSTK is the natural log value of STKOPT, and LNTDC is the natural log value of TDC. AUDCOMP*SOX is the interaction of AUDCOMP and SOX, which is a dummy variable equal to one if the sample period is 2002-2004, otherwise it is zero. LNAGE is the natural log value of director's age. LNTENURE is the natural log value of director's tenure. Other variables are as previously defined in Appendix A. The *, **, and *** represent significance levels at 0.10, 0.05 and 0.01 respectively.

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Table 4 – Regressions of CEO Pay-Performance Sensitivity on Overlapping Board composition and Control Variables n=4,949

	CEO Pay-Performance Sensitivity Variables		
Variables	TCC_PFRM	STK_PFRM	TDC_PFRM
Intercept	1.815	−0.495	0.201
	(2.30***)	(−0.26)	(0.92)
BRDSIZE	−0.009	0.004	−0.001
	(−1.49)	(0.27)	(−0.17)
AUDCOMP	0.032	0.020	−0.003
	(0.74)	(0.18)	(−0.25)
AUDCOMP*SOX	−0.019	−0.010	0.001
	(−0.43)	(−0.09)	(0.12)
CEO_NOM	−0.009	0.129	−0.001
	(−0.36)	(2.11**)	(−0.04)
CEO_COMP	0.040	−0.096	−0.004
	(1.64)	(−1.60)	(−0.55)
CHRCEO	0.035	−0.050	0.003
	(1.46)	(−0.86)	(0.48)
CEOSHARE	0.001	−0.015	−0.001
	(0.37)	(−2.95***)	(−0.59)
LNAGE	−0.521	0.212	−0.042
	(−2.60***)	(0.44)	(−0.76)
LNTENURE	0.135	−0.336	0.014
	(3.50***)	(−3.57***)	(1.33)
LNMV	0.004	0.030	−0.002
	(0.41)	(1.40)	(−0.85)
ROA	−0.094	−0.183	−0.014
	(−1.10)	(−0.94)	(−0.62)
MTB	−0.001	0.001	−0.001
	(−0.37)	(0.13)	(−1.28)
RETURN	0.002	0.001	0.001
	(11.10***)	(0.58)	(4.16***)
INVTOPP	−0.001	−0.004	−0.001
	(−0.23)	(−0.85)	(−0.45)
RETSTD	−0.001	0.001	−0.001
	(−0.60)	(1.03)	(−0.18)

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Table 4 (continued) – Regressions of CEO Pay-Performance Sensitivity on Overlapping Board composition and Control Variables n=4,949

Industry FE	Yes	Yes	Yes
R^2-adj	2.83%	0.45%	0.33%
F	3.94***	1.46**	1.34*

AUDCOMP*SOX is the interaction of AUDCOMP and SOX, which is a dummy variable equal to one if the sample period is 2002-2004, otherwise it is zero. Other variables are as previously Appendix A. The *, **, and *** represent significance levels at 0.10, 0.05 and 0.01 respectively.

We also examine the effect of an overlapping board structure on CEO pay-performance sensitivity. Table 4 reports the regression results of CEO pay-performance sensitivity from an overlapping board composition conditioned on other board compositions and control variables. We find that there is no significance between the percentage of audit committee members sitting on compensation committees (AUDCOMP) and the three measures of CEO pay-performance sensitivity (TCC_PFRM, t=0.74; STK_PFRM, t=0.18; and TDC_PFRM, t= –0.25 respectively). These findings do not support the proposition of Laux and Laux (2009) that, as the number of audit committee members sitting on the compensation committee increases, the pay-performance sensitivity decreases. The results imply that, although an overlapping board structure decreases the choices for incentive-based compensation, the benefits from increased communication among board members might lead to better corporate decisions that, in turn, might offset the negative impact on firm performance.

Effect of Board Independence and Committee Independence on CEO Compensation

Tables 5 and 6 present the results of regressing CEO compensation on board independence and committee independence conditioned on other board compositions and control variables. Similar to Tables 3 and 4, we use the percentage and level of CEO compensation as dependent variables in Table 5, and three measures of pay-performance sensitivity as dependent variables in Table 6. The evidence from Table 5 indicates that both board independence (BRDUIND) and compensation committee independence (COMPIND) have a negative association with the percentage of cash-based compensation (PCT_TCC), but it has a positive association with the percentage of equity-based compensation (PCT_STK) and the level of CEO compensation in all three measures (LNTCC, LNSTK, and LN_TDC,). Our findings show that both board independence and compensation committee independence have an association with increases in CEO compensation, suggesting that independent boards and compensation committees are ineffective corporate governance mechanisms in restraining the level of CEO compensation. Furthermore, the

composition of CEO compensation shows that both board independence and compensation committee independence have an association with an increase in the percentage of incentive-based compensation. These results are consistent with several previous studies (e.g., Main, O'Reilly, and Wade, 1995; Newman and Mozes, 1999) that report a positive relation between CEO compensation and compensation committee independence. However, the results are inconsistent with other studies (e.g., Guedj and Barnea, 2009; Anderson and Bizjak, 2003; Conyon and He, 2004) that find that independent boards and compensation committees have an association with a decrease in the level of CEO compensation.

Interestingly, we find that, although audit committee members are not directly involved in the compensation decision, audit committee independence (AUDIND) has a positive association with PCT_TCC (t=3.54), while it has a negative association with PCT_STK (t= −4.26) and all three measures of the level of CEO compensation (LNTCC, t= −3.01; LNSTK, t= −4.84; and LNTDC, t= −3.65 respectively). These results suggest that independent directors serving on audit committees prefer not to overpay CEOs because they have a legal responsibility to conduct reviews of CEO compensation to ensure financial reporting quality and to avoid the liabilities from shareholders' lawsuits or negative press coverage. These findings also imply that independent audit committees prefer cash-based compensation over equity-based compensation to CEOs to reduce monitoring costs.

Table 5 – Regressions of the Level of CEO Compensation on Board Composition and Control Variables n=4,949

	CEO COMPENSATION				
VARIABLES	**LNTCC**	**PCT_TCC**	**LNSTK**	**PCT_STK**	**LNTDC**
Intercept	1.081	0.074	0.644	0.632	2.871
	(2.09**)	(0.30)	(0.32)	(2.48**)	(3.92***)
BRDSIZE	0.017	0.004	0.034	−0.001	0.005
	(4.65***)	(2.45**)	(2.37**)	(0.47)	(0.97)
BRDIND	0.229	−0.125	1.630	0.175	0.388
	(3.76***)	(−4.31***)	(6.87***)	(5.85***)	(4.48***)
COMPIND	0.086	−0.046	0.291	0.032	0.178
	(2.10**)	(−2.30**)	(1.83*)	(1.64*)	(3.05***)
COMPIND*SOX	0.133	0.031	−0.009	−0.025	0.017
	(8.17***)	(4.06***)	(−0.15)	(−3.16***)	(0.74)
AUDIND	−0.141	0.079	−0.886	−0.098	−0.244
	(−3.01***)	(3.54***)	(−4.84***)	(−4.26***)	(−3.65***)
CEO_NOM	0.053	−0.017	0.145	0.014	0.067
	(3.18***)	(−2.11**)	(2.24**)	(1.70*)	(2.85***)

CEO_COMP	−0.038	0.001	0.035	0.008	−0.032
	(−2.38**)	(0.14)	(0.55)	(0.95)	(−1.38)
CHRCEO	0.119	−0.021	0.223	0.017	0.18
	(7.68***)	(−2.85***)	(3.66***)	(2.22**)	(8.12***)
CEOSHARE	−0.008	0.007	−0.071	−0.008	−0.022
	(−6.37***)	(10.95***)	(−14.50***)	(−12.69***)	(−12.03***)
LNAGE	0.986	0.186	0.459	−0.121	0.524
	(7.43***)	(2.96***)	(0.89)	(−1.85*)	(2.79***)
LNTENURE	−0.389	0.056	−0.396	−0.053	−0.277
	(−5.27***)	(4.49***)	(−3.88***)	(−4.14***)	(−7.43***)
LNMV	0.247	−0.058	0.527	0.053	0.409
	(42.54***)	(−21.25***)	(23.26***)	(18.33***)	(49.44***)
ROA	0.342	0.125	−0.208	−0.091	−0.115
	(6.55***)	(4.85***)	(−1.02)	(−3.10***)	(−1.53)
MTB	−0.001	0.001	−0.001	−0.001	−0.001
	(1.83*)	(0.14)	(−0.46)	(−0.17)	(−1.44)
RETURN	0.002	−0.001	0.003	0.001	0.002
	(17.17***)	(−0.37)	(4.89***)	(0.12)	(11.64***)
INVTOPP	−0.007	−0.001	−0.006	0.001	−0.005
	(−6.06***)	(−0.69)	(−1.26)	(0.79)	(−2.68***)
RETSTD	−0.001	−0.001	0.001	0.001	0.001
	(−5.72***)	(−5.63***)	(1.12)	(4.35***)	(2.51**)
Industry FE	Yes	Yes	Yes	Yes	Yes
R^2-adj	48.47%	23.18%	26.87%	21.14%	50.68%
F	92.26***	30.23***	36.96***	27.23***	100.71***

LNTCC is the natural log value of TCC, LNSTK is the natural log value of STKOPT, and LNTDC is the natural log value of TDC. COMPIND*SOX is the interaction of COMPIND and SOX, which is a dummy variable equal to one if the sample period is 2002-2004, otherwise it is zero. Other variables are as previously defined in Appendix A. The *, **, and *** represent significance levels at 0. 10, 0.05, and 0.01 respectively.

We find no evidence in Table 6 that board independence (BRDIND) and audit committee independence (AUDIND) have an association with any of the three measures of CEO pay-performance sensitivity. However, we do find that compensation committee independence (COMPIND) has a significant association with equity-based pay-performance sensitivity (STK_PFRM, t=1.94), indicating that independent compensation committees contract CEO compensation to align equity-based compensation with firm performance.

Table 6 – Regressions of CEO Pay-Performance Sensitivity on Board Composition and Control Variables n=4,949

Variables	TCC_PFRM	STK_PFRM	TDC_PFRM
Intercept	1.771	−0.053	0.202
	(2.23**)	(−0.03)	(0.89)
BRDSIZE	−0.010	0.002	−0.001
	(−1.73*)	(0.13)	(−0.28)
BRDIND	−0.045	0.225	−0.006
	(−0.48)	(0.99)	(−0.22)
COMPIND	0.090	0.300	0.026
	(1.42)	(1.94*)	(1.46)
COMPIND*SOX	−0.028	0.022	0.001
	(−1.14)	(0.36)	(0.13)
AUDIND	−0.016	−0.182	0.006
	(−0.22)	(−1.03)	(0.29)
CEO_NOM	−0.010	0.115	−0.001
	(−0.38)	(1.87*)	(−0.14)
CEO_COMP	0.039	−0.098	−0.004
	(1.58)	(−1.62)	(−0.52)
CHRCEO	0.035	−0.066	0.003
	(1.47)	(−1.13)	(0.39)
CEOSHARE	0.001	−0.012	−0.001
	(0.45)	(−2.41**)	(−0.36)
LNAGE	−0.510	0.028	−0.048
	(−2.50**)	(0.06)	(−0.87)
LNTENURE	0.134	−0.291	0.016
	(3.32***)	(−2.98***)	(1.40)
LNMV	0.004	0.028	−0.002
	(0.43)	(1.31)	(−0.86)
ROA	−0.093	−0.187	−0.014
	(−1.10)	(−0.96)	(−0.62)
MTB	−0.001	0.001	−0.001
	(−0.38)	(0.09)	(−1.28)
RETURN	0.002	0.001	0.001
	(11.12***)	(0.56)	(4.13***)
INVTOPP	−0.001	−0.004	−0.001
	(−0.22)	(−0.87)	(−0.43)
RETSTD	−0.001	0.001	−0.001
	(−0.53)	(1.02)	(−0.24)
Industry FE	Yes	Yes	Yes
R^2-adj	2.83%	0.56%	0.36%
F	3.83***	1.55***	1.35**

COMPIND*SOX is the interaction variable of COMPIND and SOX, which is a dummy variable equal to equal if the sample period is 2002-2004, otherwise it is zero. LNAGE is the natural log value of director's age. LNTENURE is the natural log value of director's tenure. Other variables are as previously defined in Appendix A. The *, **, and *** represent significance levels at less than 0.10, 0.05, and 0.01 respectively.

Effect of SOX on Board's Oversight Effectiveness when Contracting CEO Compensation

Tables 3 and 4 present the effect of SOX on the board's oversight effectiveness over CEO compensation. The coefficients of AUDCOMP*SOX in Table 3 show a positive association with PCT_TCC (0.035, t=2.50) and a negative association with PCT_STK (−0.022, t= −1.74), indicating that overlapping independent audit and compensation committee members reduce the percentage of CEO's equity-based compensation after SOX. The implication of the results suggests that SOX results in directors' conservative action against risk taking through granting less incentive-based compensation to CEOs.

However, Table 4 shows that AUDCOMP*SOX has no significant association with any of the three measures of CEO pay-performance sensitivity (TCC_PFRM, t= −0.43; STK_PFRM, t= −0.09; and TDC_PFRM, t=0.12 respectively). These findings do not support the proposition of Laux and Laux (2009) that claims a negative association between the proportion of audit committee members sitting on the compensation committee and pay-performance sensitivity. In other words, we find no evidence that overlapping compensation committees have a negative effect on CEO pay-performance sensitivity in either the pre- or post-SOX periods.

Furthermore, Table 5 shows that COMPIND*SOX has a significant and positive association with cash-based compensation (LNTCC, t=8.17 and PCT_TCC, t=4.06 respectively) but has a negative association with equity-based compensation (PCT_STK, t=−3.16). Consistent with Chhaochharia and Grinstein (2009), the findings suggest that independent compensation committees take conservative actions by granting more cash-based and less equity-based compensation to CEOs after SOX. On the other hand, an insignificant coefficient for COMPIND*SOX in Table 6 indicates that the positive association between COMPIND and STK_PFRM does not change after SOX.

Effects of Independent and Overlapping Board Structures on Accruals Management

Table 7 reports the results of the effects of independent and overlapping board structures on accruals management.[1] Model 1 of Table 7 shows a negative association between the discretionary accruals (DACC) and AUDIND*SOX (t=−2.02).[2] This result is consistent with Chang and Sun (2009; 2010) that,

[1] Previous studies find that earnings management reduced when the firm's auditor is a Big 4 (or then Big 6) auditor. Therefore, we control for the firm's auditor in the tested regressions as reported in Table 7.

[2] The coefficient of AUDIND is 0.008 and the coefficient of AUDIND*SOX is −0.007, suggesting a mean reversion of discretionary accruals in the post-SOX period. Compared with the pre-SOX period, the mean reversion in the post-SOX period implies that SOX discourages managers from continuing income-increasing accruals management.

compared with the pre-SOX period, independent audit committees are more effective in monitoring accruals management in the post-SOX period. Inconsistent with Klein (2002) and Chang and Sun (2009), Table 7 shows that discretionary accruals have no significant association with board independence.

Table 7 – Discretionary Accruals on Board Composition and Control Variables

Dependent Variable=DACC		n=4,355
Independent Variable	Model 1	Model 2
Intercept	−0.145	−0.134
	(−1.25)	(−1.16)
BRDSIZE	−0.001	−0.001
	(−0.74)	(−0.37)
BRDIND	−0.005	
	(−0.40)	
COMPIND	−0.009	
	(−1.01)	
AUDIND	0.008	
	(0.71)	
AUDIND*SOX	−0.007	
	(−2.02**)	
COMPAUD		0.018
		(2.78***)
COMPAUD*SOX		−0.010
		(−1.46)
AUDITOR	−0.004	−0.004
	(−0.70)	(−0.71)
CEO_NOM	0.001	0.001
	(0.12)	(0.11)
CEO_COMP	−0.001	−0.001
	(−0.27)	(−0.35)
CHRCEO	0.002	0.002
	(0.68)	(0.50)
CEOSHARE	−0.001	−0.001
	(−1.34)	(−1.16)
LNAGE	0.043	0.036
	(1.44)	(1.24)
LNTENURE	0.004	0.005
	(0.70)	(0.88)
LNMV	−0.001	−0.001
	(−0.65)	(−0.65)
RETURN	−0.001	−0.001
	(−1.35)	(−1.45)
MTB	0.001	0.001
	(1.31)	(1.32)
INVTOPP	−0.001	−0.001
	(−0.45)	(−0.46)
RETSTD	−0.001	−0.001
	(−0.25)	(−0.36)
LEVERAGE	0.003	0.005
	(0.25)	(0.48)
Industry FE	Yes	Yes
R^2-adj	1.46%	1.54%
F	2.24***	2.35***

Dependent variable is discretionary accruals, which is the residual value calculated using the cross-sectional modified Jones model from the Kothari, Leone, and Wasley (2005) method. AUDIND*SOX is the interaction variable of AUDIND and SOX, which is a dummy variable with a value of one if the

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sample period is 2002-2004, otherwise it is zero. COMPAUD*SOX is the interaction variable of COMPAUD and SOX. LNAGE is the natural log value of director's age. LNTENURE is the natural log of director's tenure. Other variables are as previously defined in Appendix A. The *, **, and *** represent significance levels at less than 0.10, 0.05, and 0.01 respectively.

Model 2 of Table 7 shows that an overlapping audit committee (COMPAUD, t=2.78) has a positive association with discretionary accruals, suggesting that an overlapping board structure weakens the oversight effectiveness of audit committees when monitoring accruals management. This finding supports the proposition of Laux and Laux (2009). However, it is inconsistent with findings from Chandar et al. (2008) that firms with overlapping audit and compensation committees have higher financial reporting quality. Furthermore, we find that COMPAUD*SOX (t=−1.46) has a negative but insignificant association with discretionary accruals, indicating that the oversight effectiveness of overlapping audit committees does not significantly improve after SOX.

Other Properties of Board Composition, CEO Compensation, and Accruals Management

We report the effect of other board composition variables on CEO compensation and accruals management in Table 3 through Table 7. The results are generally consistent. First, Tables 3 and 5 show that board size (BRDSIZE) has a significant association with LNTCC (t=4.66, 4.65) and PCT_TCC (t=2.90, 2.45), suggesting that CEOs of companies with large boards receive more cash-based compensation. Furthermore, Table 6 shows a marginally significant and negative association between board size (BRDSIZE) and the sensitivity of cash-based pay-performance (TCC_PFRM, t= −1.73). This result is partially consistent with Yermack (1996) that small boards exhibit better firm performance.

Consistent with Core et al. (1999), we find that CEOs sitting on nominating committees (CEO_NOM) receive more compensation (LNTCC, LNSTK, and LNTDC in Tables 3 and 5). In addition, CEO_NOM has a positive association with the equity-based pay-performance sensitivity (STK_PFRM, t=2.11 and t=1.87 in Tables 4 and 6 respectively), suggesting that companies with CEOs sitting on the nominating committees award CEOs more equity-based compensation and that the compensation is aligned with firm performance. Similar to the findings of Anderson and Bizjak (2003), we find no evidence that CEOs sitting on compensation committees act opportunistically in their pay decisions. In fact, our results show that CEOs sitting on compensation committees (CEO_COMP) receive less cash-based compensation (LNTCC, t= −2.29 and t= −2.38 in Tables 3 and 5 respectively).

Furthermore, consistent with Core et al. (1999), we find that the level of CEO compensation has a positive association with the duality of CEOs (CHRCEO). This result suggests that CEOs with dual roles are rewarded more compensation to bear more responsibilities. Alternatively, the results might suggest that CEOs with dual

roles are able to influence compensation committees' decisions to reward them more. Consistent with previous studies (e.g., Core et al., 1999; Anderson and Bizjak, 2003), we find that the level of CEO compensation has a negative association with CEO ownership (CEOSHARE, Tables 3 and 5). Moreover, CEOSHARE has a negative association with equity-based pay-performance sensitivity (STK_PFRM, t= −2.41 and t= −2.95, Tables 4 and 6 respectively).

Table 7 shows no evidence that discretionary accruals have a significant association with CEO_NOM, CEO_COMP, or CEO ownership (CEOSHARE).

Conclusions

We investigate the effects of independent and overlapping board structures on CEO compensation, CEO pay-performance sensitivity, and discretionary accruals. Our findings show that overlapping compensation committees have a negative association with the level of CEO compensation in the pre-SOX period. In the post-SOX period, overlapping compensation committees have an association with an increase in the percentage of cash-based compensation and a decrease in the percentage of equity-based compensation granted to CEOs. Our findings generally support the proposition of Laux and Laux (2009) that overlapping compensation committee members take conservative actions by granting CEOs less equity-based compensation to reduce the monitoring cost of financial reporting. Inconsistent with Laux and Laux (2009), our findings do not suggest that overlapping compensation committees have a negative association with CEO pay-performance sensitivity. On the accruals management side, we find evidence to support Laux and Laux (2009) that an overlapping board structure weakens the oversight mechanisms of audit committees in monitoring financial reporting.

We further find that neither board nor compensation committee independence is an effective oversight mechanism in restraining the level of CEO compensation. Our results also show that independent boards and compensation committees have an association with a high percentage of incentive-based and a low percentage of cash-based CEO compensation; however, the associations diminish after SOX. In contrast, compensation committee independence has a positive association with equity-based, pay-performance sensitivity, indicating that independent directors effectively align incentive-based CEO compensation with firm performance. On the other hand, we find that independent audit committees have an association with more cash-based, less equity-based, and less total compensation, suggesting that audit committees prefer to take conservative steps to constrain CEO compensation. Additionally, our results show that independent audit committees are more effective in monitoring the income-increasing accruals management in the post-SOX period, implying that SOX improves the oversight effectiveness of independent audit committees.

The empirical evidence also provides the implication that SOX induces CEOs to take conservative steps in risk taking. We find that overlapping compensation committees take conservative actions by granting CEOs more cash-based and less equity-based compensation after SOX. In addition, although we find that the oversight function of independent audit committees has significantly improved after SOX, our findings show that overlapping audit committees have an association with an increase in accruals management.

Appendix A. Definition of Variables

Variable	Definition
TDC	The sum of salary, bonus, options, restricted stocks, and total value of stock options granted, long-term incentive payouts, and all other compensation (in thousands, ExecuComp data item TDC1).
TCC	The CEO cash-based compensation comprised by salary and bonus (in thousands).
STKOPT	TDC minus TCC and all other compensation (in thousands, ExecuComp data item OTHANN).
PCT_TCC	The percentage of TCC divided by TDC.
PCT_STK	The percentage of STKOPT divided by TDC.
ChgPR (%)	The percentage change in stock price, which is $(Price_t - Price_{t-1})/Price_t$.
ChgTCC	The change in cash-based compensation, which is $TCC_t - TCC_{t-1}$.
ChgSTK	The change in equity-based compensation, which is $STKOPT_t - STKOPT_{t-1}$.
ChgTDC	The change in annual total compensation, which is $TDC_t - TDC_{t-1}$.
TCC_PFRM (%)	The sensitivity of CEO cash compensation in response to the change in stock price, which is ChgPR divided by the change of TCC.
STK_PFRM (%)	The sensitivity of change of equity-based compensation in response to the change in stock price, which is ChgPR divided by ChgSTK.
TDC_PFRM (%)	The sensitivity of total compensation in response to the change in stock price, which is ChgPR divided ChgTDC.
BRDSIZE	The total number of board directors.
AUDSIZE	The total audit committee members on the board.
COMPSIZE	The total compensation committee members on the board
BRDIND (%)	The percentage of the independent board directors divided by BRDSIZE
AUDIND (%)	The percentage of the independent audit committee members scaled by AUDSIZE.
COMPIND (%)	The percentage of independent compensation committee members divided by COMPSIZE
OVLP_AUDCOMP	The number of the independent directors sitting on both audit and compensation committees.
AUDCOMP (%)	The percentage of OVLP_AUDCOMP divided by COMPSIZE.
COMPAUD (%)	The percentage of OVLP_AUDCOMP scaled by AUDSIZE.
AUDITOR	A dummy variable equal to one if the auditor is a Big 4 or Big 6 auditor, otherwise it is zero.
CEO_NOM (%)	A dummy variable equal to one if the CEO sits on the company's nominating committee, otherwise it is zero.
CEO_COMP (%)	A dummy variable equal to one if the CEO sits on the company's compensation committee, otherwise it is zero.
CHRCEO (%)	A dummy variable equal to one if the company's CEO also serves as the chairman of the board, otherwise it is zero.
CEOSHARE (%)	The percentage of CEO's ownership disclosed in the company's proxy statement.
DIRAGE	The age of the board director.
DIRTENURE	The board tenure of the board director.
LNMV	The nature logarithm of the firm's equity (MV), which is the fiscal year-end stock price multiplied by the common stock outstanding.
ROA	The return on assets, which is net income before extraordinary items divided by total assets.
MTB	The market to book, which is MV divided by the book value of the firm's equity.

RETURN	The average annual market returns.
INVTOPP	The average of the year-end, market-to-book value over the past five years.
RETSTD	The standard deviation of the annual market returns for the past five years.
LEVERGAE	The ratio of total debt over total assets.

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